

JUL 22 1943

# D E N T A L

# Digest



JULY 1943

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# THE DENTAL Digest

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NO. 7

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EDWARD J. RYAN, B.S., D.D.S., *Editor*

ETHEL H. DAVIS, A.B., *Assistant Editor*

708 Church Street, Evanston, Illinois

LIEUTENANT ROGER KENNETH STOCKTON, (DC), A.U.S., was in general practice before he entered the service. He also taught at Illinois, his alma mater (class of 1939), for two years where he was associated with Doctor Stanley Tylman in the department of Crown and Bridge. In October, 1942, Doctor Stockton wrote for us on the CAST-BANDED ACRYLIC VENEER CROWN.

L. M. SAGHIRIAN, D.D.S. (University of Pennsylvania, 1924) is a general practitioner whose particular interest in oral surgery has been reflected in these pages several times, the last in January, 1942, when he presented his technique for electrosurgical correction of low gum and oral tissue bands. Doctor Saghirian's article in this issue with its many illustrations is another typical DIGEST clinic paper, a demonstration of mechanical aids in the treatment of periodontosis. Doctor Saghirian is associate in stomatology in the

## About Our CONTRIBUTORS

Graduate School of Medicine, University of Pennsylvania.

JOSEF NOVITZKY, D.D.S. (University of California College of Dentistry) presented an EVALUATION OF THERMAL THERAPY here in May, 1941 and described LUDWIG'S INDURATIONS for us in January, 1942. In this issue Doctor Novitzky discusses the surgical problem of prolonged postoperative bleeding. His years of experience in surgical pathology entitles him to attentive reading.

JACOB J. STARK, D.D.S. (New York University College of Dentistry, 1916) has previously contributed to the literature. He was formerly special lecturer in prosthetics at New York

College of Dentistry. Doctor Stark has a general practice.

FRED D. MILLER, D.D.S. (University of Pennsylvania, 1912) has contributed articles to *The Dental Digest*, *ORAL HYGIENE*, *Hygeia*, and *Esquire*. Doctor Miller is well known as an active member of the dental professional organizations. He is in general practice. Practical suggestions for the postoperative care of extraction wounds are always timely. Doctor Miller offers these from one approach, Doctor Novitzky from another.

GLENN E. WILLHELMY, D.D.S. (Kansas City-Western Dental College, 1914) has been interested in aviation dentistry for many years. Doctor Willhelmy has previously contributed to the literature on the subject. In his present article he attempts merely to review the available reports regarding aerodontia in the hope of stimulating research in this subject.

# Acrylic Bridge Using Cast-Banded Acrylic Veneer Crowns as Retainers

LIEUTENANT ROGER K. STOCKTON, Dental Corps, A.U.S., Spadra, California

## DIGEST

1. Prepare both abutment teeth for the reception of cast-banded acrylic veneer crowns.
2. Prepare occlusal rests in both abutment teeth.
3. Adapt gold bands to both abutment teeth.
4. Wax a bar between bands and cast.
5. Solder gold bar to bands.
6. Gold bar and bands are waxed.
7. Invest waxed bridge in flask.
8. Boil out wax.
9. Mask gold with titanium dioxide solution.
10. Apply acrylic material to bridge, and process.
11. Grind away excess acrylic and polish.
12. Cement bridge on abutment teeth. Check occlusion.

IN THE OCTOBER, 1942 issue of this magazine, the technique for the cast-banded acrylic veneer crown was demonstrated. This present article describes the technique in preparing a fixed acrylic bridge utilizing two cast-banded acrylic veneer crowns as retainers. This type of bridge fulfills all the requirements necessary for a successful bridge: strength, minimal abutment tooth destruction, occlusion, contact, and excellent esthetics.

## Preparation of Abutment Teeth

The two abutment teeth are prepared for the reception of crowns (Fig. 1). The preparation has no undercuts; it is extended midway between the gingival crest and the periodontal membrane; it



Fig. 1—Preparation of abutment teeth including occlusal rest preparation.

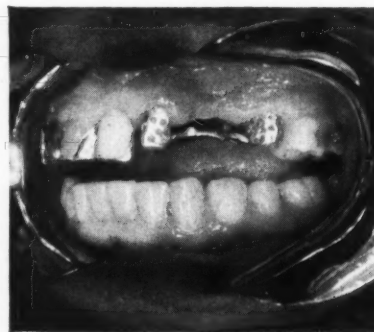


Fig. 2—Cast gold bar soldered to gold band retainers. Note perforations in gold bands.

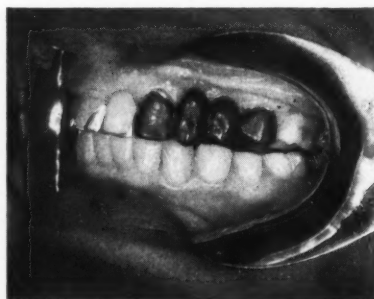


Fig. 3—Bridge waxed and tried in mouth of patient.

is convergent gingivo-occlusally, and the two abutment preparations, in so far as possible, parallel each other. The occlusal surfaces are ground sufficiently to allow a space the thickness of base-plate wax when the teeth are in occlusion. This will assure bulk of acrylic for strength in the finished bridge.

The mesial-occlusal surface of the

posterior abutment tooth and the distal-occlusal surface of the anterior abutment tooth are prepared with a small stone to form occlusal rest preparations which will be occupied by the ends of a cast gold bar.

## Adapting the Gold Bands

After finishing the crown preparations, the circumferences of the abutment teeth are obtained with the dentimeter. From these determined lengths, two pieces of 24 K. 36 gauge gold plate are obtained, with the widths equal to the gingivo-occlusal height plus half the occlusal width.

These gold bands are soldered, festooned to the gingiva, and adapted as they were for the cast-banded acrylic crown described in the October, 1942 issue of this magazine.

A small stone is slowly revolved on the gold over the occlusal rest areas for better adaptation.

The finished gold bands should be well adapted to the teeth and extend midway between the superior attachment of the periodontal membrane and the gingival crest.

## The Gold Bar

The gold bands are placed on the abutment teeth and a plaster impression is taken in a swivel tray. The impression is removed from the mouth, assembled with the gold bands in their respective places, and run up in Ransom and Randolph gray investment. After the investment has set sufficiently, the plaster impression is broken away, the positive model with the gold bands being left in place.

Inlay wax is used to make a bar between the gold bands incorporating the occlusal rest areas. This waxing is readily accomplished with the wax formed for lingual bars. It is molded to the shape of a "V" to increase resistance to torque. Small "T"'s are waxed to the bar approximately where the



Fig. 4—Acrylic bridge is cemented into place. No gold is visible.

pontics will be placed. This waxing is invested, heated, and cast with hard gold, preferably, type C.

The gold bar is placed on the model and carefully soldered to the gold bands. The entire gold structure is removed from the investment and tried in the mouth. Holes are drilled or punched into the gold bands strategically placed and away from the gingival periphery. The bar and bands are replaced in the mouth and readapted (Fig. 2).

Another impression is taken, this time with dissolving plaster. A wax bite is obtained along with an occluding impression. The impressions are removed, reassembled, and invested with rapid stone. The models are removed from the impressions and mounted in occlusion with the aid of the wax bite on a crown and bridge articulator.

The bridge is fully waxed into occlusion with either blue inlay wax or ivory acrylic wax. The wax around the gingival periphery is removed from both bands and the bridge is tried in the mouth of the patient (Fig. 3). If the contour, contact, alignment, anatomy, and occlusion are satisfactory, the bridge is carefully removed from the patient's mouth. The gingival wax is replaced, but this time in excess, so that there will be more space for the flow of acrylic and so that there will be excess for polishing. Wax is also added to the contact areas to assure tight contacts after polishing. The shade is obtained at this visit.

### Investing the Bridge

The waxed bridge is ready for investment and is invested in the lower half of the acrylic flask, equal parts of impression plaster and rapid stone being

used. Care must be taken in placing the bridge in the flask to permit the buccal portion to be exposed and as much as possible of the occlusal portion. This is done to facilitate color distribution and esthetics.

Vaseline is wiped over the exposed investment, and the same mixture of investment is vibrated into the upper half of the flask. After the investment is set, the wax is boiled out completely. Washing with chloroform may be instituted at this time to assure removal of any residual wax.

The flask is cooled and the bridge is ready to be processed with acrylic.

### Masking Gold

The acrylic, not being totally opaque, would be off color owing to the refraction of the gold color through the acrylic. To guard against this probability, an opaque masking agent is used to prevent gold color refraction and subsequent impairment of the acrylic color.

The masking agent used is the same agent that was used in the cast-banded acrylic veneer crown technique. Equal portions of titanium dioxide and gingival colored acrylic are triturated in a mortar and pestle. This admixture is dissolved in chloroform until the consistency simulates finger-nail polish. This liquid may be too white, thereby resulting in a finished acrylic with a white background. For this reason, the masking solution is shaded with various acrylic colors until it resembles the desired gingival color.

The exposed buccal and occlusal portions of the bands along with the connecting bar are painted with the masking solution. Care must be exercised to prevent the solution from getting on the adjacent investment. If total opacity is not accomplished with one application, another application must be applied. The case is now ready for processing with acrylic.

### Application of Acrylic

The gingival and incisal acrylics are placed in separate mixing jars according to the shade guide. The monomer or acrylic liquid is added to the jars until partial polymerization has taken place.



Fig. 5—Appearance of acrylic bridge from lateral to second bicuspid. (This and preceding illustrations through the courtesy of the College of Dentistry, University of Illinois.)

The gingival acrylic is carefully packed into the lower half of the flask. Make sure that all spaces and crevices have been filled. An excess of gingival acrylic is added. Wet cellophane is placed over the lower half of the flask. The upper half of the flask is placed in position and pressed. The flask is placed in boiling water for one minute, separated, and excess acrylic is removed. The portion of gingival acrylic that is to be replaced with incisal acrylic to obtain the desired color distribution is carefully removed with a pair of small sharp scissors. Incisal acrylic is replaced where the gingival acrylic was removed and re-pressed. The flask is again opened. If the color distribution is satisfactory, the acrylic bridge is ready to be processed.

### Processing

The flask is closed and placed in a pan of tepid water. This is heated gradually until the boiling point is reached. After thirty minutes in boiling water, the flask is removed from the boiling water and cooled slowly. When cool, the bridge is carefully removed from the investment. Excess acrylic is ground away and the bridge is thoroughly polished. The gingival periphery of both crowns is reduced to a polished razor-like edge.

The bridge is tried in the patient's mouth to make sure of occlusion, contact, alignment, and anatomy. The acrylic bridge is then cemented into place (Figs. 4 and 5).

*Thirteenth General Hospital.*



# Mechanical Aids in the Treatment of Periodontosis

LEVON M. SAGHIRIAN, D.D.S., Philadelphia

## DIGEST

In the clinical management of periodontosis recent advances in surgery, electro-surgery, and the newer drugs have produced appreciable results. The more extensive use of these modern techniques has brought to light the necessity for a wider knowledge of the character of this disease, its etiology, and course of treatment. In addition it is particularly evident that certain mechanical aids are invaluable in stabilization and fixation of poorly supported teeth, before, during, and

after treatment, and that the equilibration of occlusion and the relief of abnormal stresses should receive consideration.

It appears that with the development of newer techniques and therapy we have temporarily lost sight of the importance of these mechanical aids which are essential adjuncts to the restoration of normal function.

The management of periodontosis requires a careful diagnosis, the development of technical skill of intricate nature, knowledge of chemotherapy and prosthetics.

A great deal of research in nutrition and medical sciences applies to periodontal pathology and we may be benefited by these observations in our clinical practice.

The newer techniques should not be regarded as shortcuts to treatment. With proper training they are applicable to the treatment of periodontosis, but should be complemented with conservative methods and guided by an understanding of biologic and prosthetic factors involved, so that successful results of long duration may be obtained.

## Etiology

THE ETIOLOGY of periodontosis is often uncertain. Because it is assumed to be associated with, if not caused by systemic dyscrasia, it is difficult to estab-

lish a definite etiology. Medical knowledge in nutrition, endocrinology, hematology and bacterio-pathology coordinated with the stomatologic and mechanical studies of occlusion are the

basis on which a diagnosis can be made.

## Periodontosis

Periodontosis is characterized by diffuse atrophy of supporting alveolar tis-

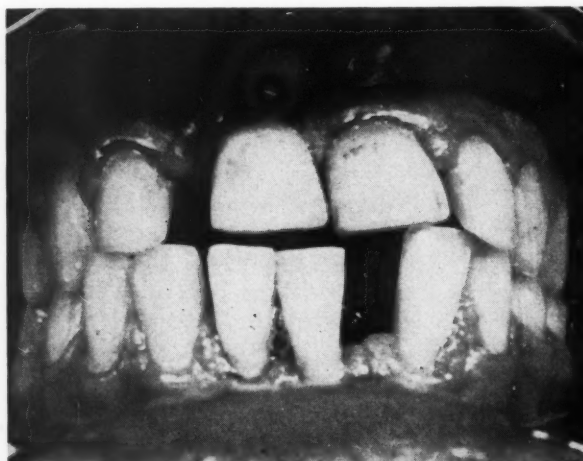


Fig. 1—"Pathologic wandering" of teeth. The mouth of a diabetic patient, aged 18. Hyperplastic and hemangioma-like gingivae are seen.



Fig. 2—Malocclusion. Periodontal disease accentuated in areas of traumatic occlusion. Acute periodontitis as a result of constant irritation and oral sepsis. Preliminary requirement to treatment is the freeing of the locked bite.



Fig. 3—Physiologic recession. The patient, aged 68, has a healthy mouth. Teeth are firm and gingival tone is excellent. The gums have followed absorption of bone. No pockets are present. Cusps and incisal edges are shortened by natural wear. One tooth was lost through caries. In treatment of periodontitis final results should simulate Nature's physiologic recession.

ues. It is associated with loosening, migration, and elongation of teeth (Fig. 1). Pockets are deep; subgingival calculus is present, and pressure on the gums usually results in pus discharge (pyorrhea). Mobility of the teeth in early stages may be in a buccal-lingual direction, and in advanced stages, in a mesio-distal or even vertical direction.

The interdental papillae are usually hypertrophic, and in the presence of periodontitis may be ulcerated or hemangiomatic in character.

Fetor oris and heavy calcarious deposits may be complementary symptoms, but often the mouth appears to be in well cared for condition.

The roentgenologic examination indicates the level of bone recession, but the depth of each pocket is determined either by measuring with a calibrated probe or by roentgenology, with individual gutta-percha points inserted in each pocket.

Periodontitis, in itself a chronic protracted disease, is not to be confused with interstitial gingivitis, ulceromembranous stomatitis, periodontitis of local origin, or the oral manifestations of acute organic or toxic diseases. It may, however, be complicated by a combination of such inflammatory symptoms (Fig. 2).

#### Histo-Pathology

Microscopic sections show marked round cell infiltration; the crevicular epithelium is not intact, and the under-

lying connective tissue is ulcerated. The periodontal fibers are injured, there is qualitative and quantitative osteoclasia.

Drifting, migration, and elongation of teeth are generally attributed to fibrosis in the attachment tissues. Granulation tissue forms readily, particularly following electrosurgery, and eventually is organized into fibrous tissue—soft pliable scar tissue. Healthy epithelialization completes the initial healing of the wound. Regeneration of alveolar bone takes place provided its organic matrix is not mutilated. Hypercementosis is also a probable reparative process. Eventually the products of inflammation resolve and the tissues in time assume the character of normal mucoperiosteum.

#### Prognosis

It must be understood that owing to the protracted nature of the disease the prognosis may not be favorable. In a good percentage of cases, in the hands of an experienced operator and with patient cooperation in maintaining good oral hygiene the viability of the teeth may be prolonged; therefore the drastic removal of teeth founded on roentgeno-



Fig. 4—Preoperative roentgenographic examination.

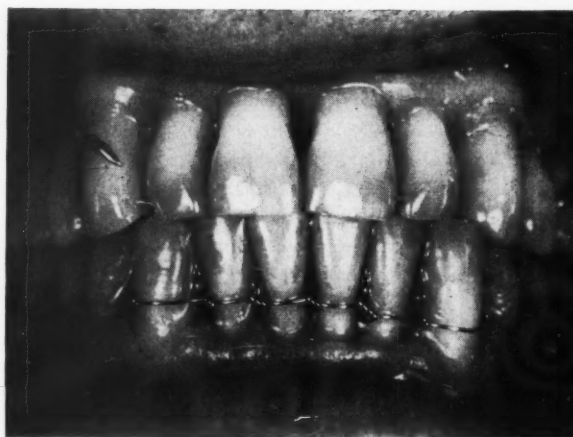


Fig. 5—Upper teeth were treated six months previously. Missing posteriors were replaced. Wire splint applied to lower anteriors.

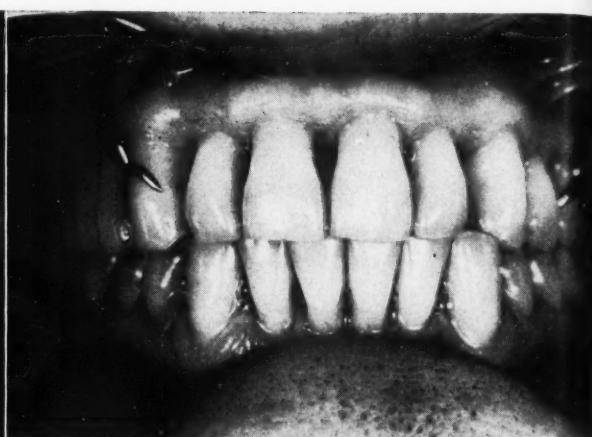


Fig. 6—One week following electrosurgical resection.

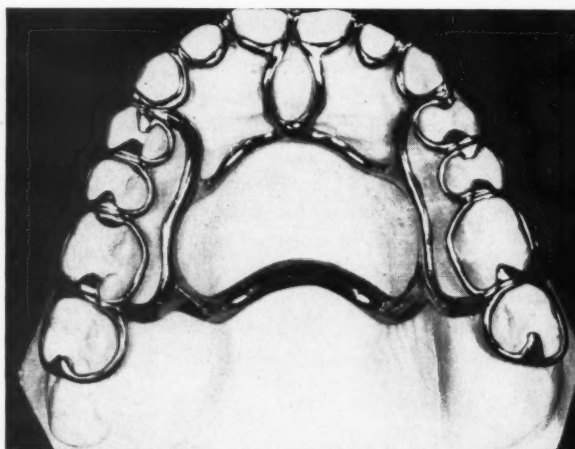


Fig. 7



Fig. 8

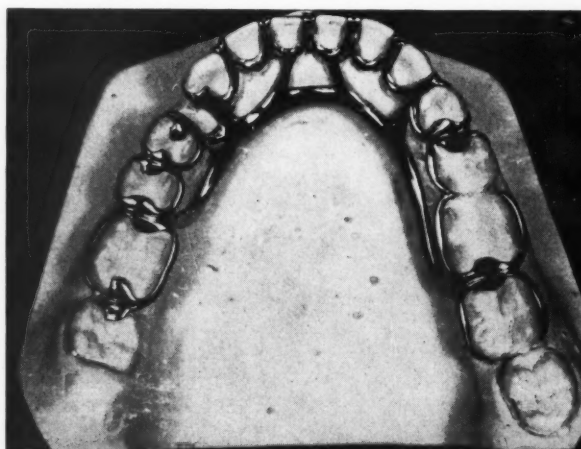


Fig. 9

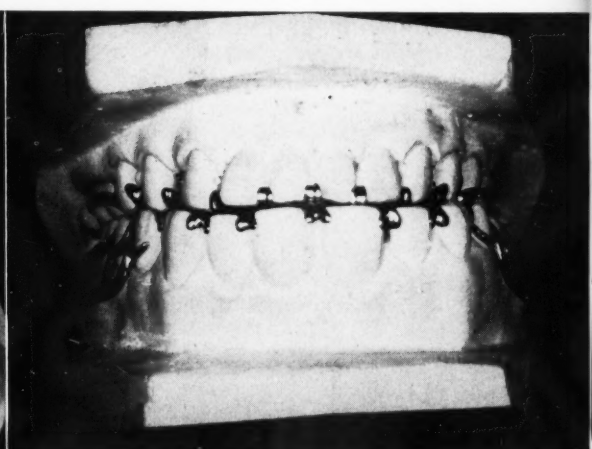


Fig. 10

Figs. 7, 8, 9, 10—Removable periodontal appliances of rigid chrome-

alloy surveyed and designed to splint teeth with weak support.

graphic evidence alone is to be condemned. Treatment may be undertaken on the basis of clinical symptoms and probable soft tissue response.

### **Surgical Gingivoplasty, Gingivectomy, and Electrosurgical Resection**

Foci of infection of periodontal ori-

gin may often be an etiologic factor in systemic disease. The importance of periapical infection of pulpless teeth has been overrated, whereas gingival and



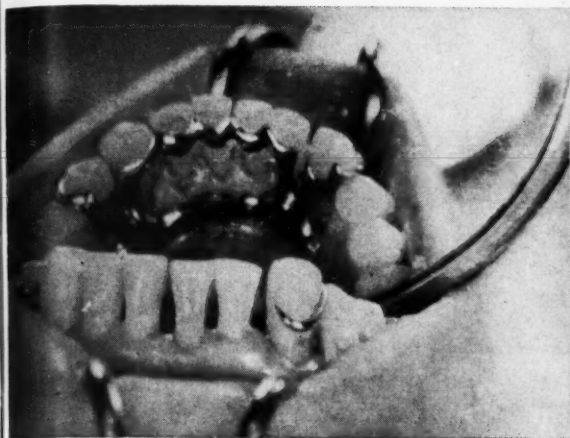


Fig. 11—A lingual bar appliance is constructed, designed to distribute retention stresses evenly, and give the teeth support against inward pressure. Deep pockets are eliminated electrosurgically. Interproximal sluiceways and deflecting contours are produced.

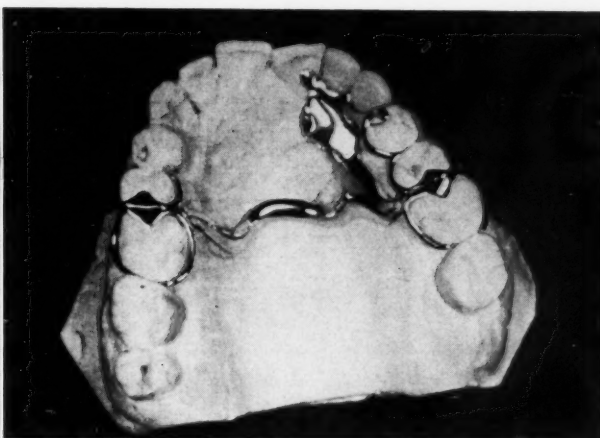


Fig. 12—A removable appliance supplying two teeth. The case surveyed and designed to distribute stresses and act as a splint on the attached teeth, which are affected by periodontitis.



Fig. 13—Preoperative view of mouth with periodontitis. The palatal pockets of the upper and labial pockets of the lower jaw were deep.

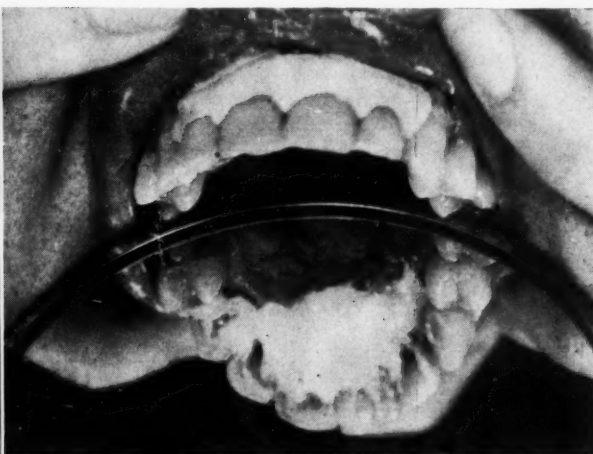


Fig. 14—Upper and lower anterior regions electrosurgically resected. A surgical cement pack is applied.

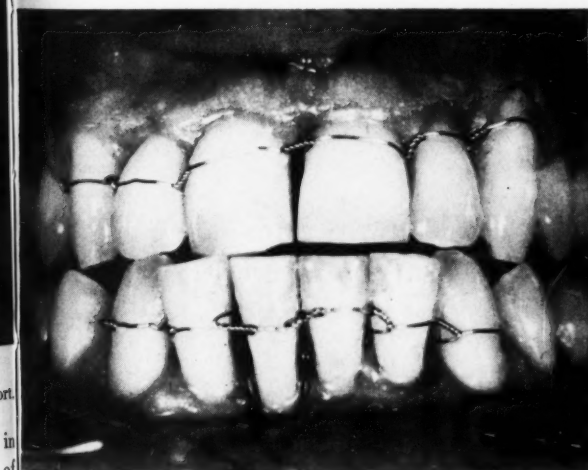


Fig. 15—Two weeks later when continuous wire splints were applied. The entire mouth was then treated by chemotherapy.



Fig. 16—Patient, aged 30. Periodontitis: Migration of teeth and lack of occlusal contact localized in the upper anterior region. Unknown etiology with deficiency disease a probable cause. The pocket on left first incisor is 7 mm. deep.

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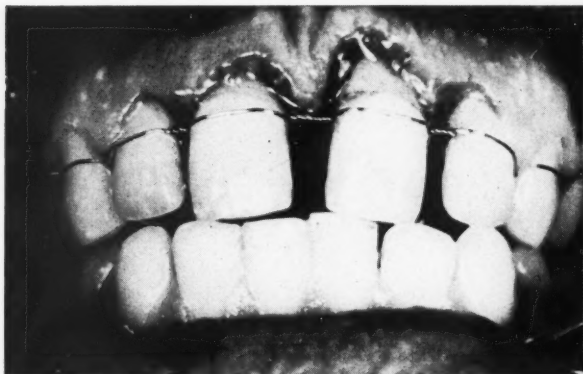


Fig. 17—Electrosurgical resection followed by wire splinting to prevent further wandering.

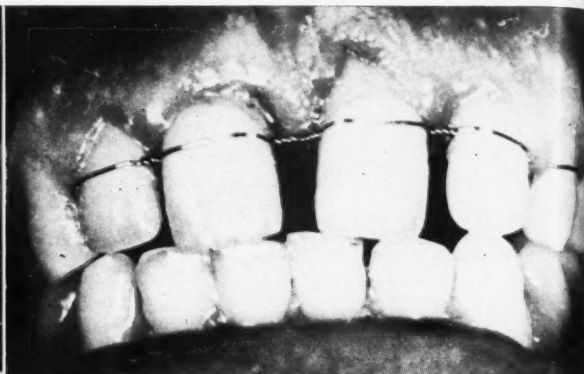


Fig. 18—Two weeks following resection shown in Fig. 17. There is a tendency to formation of excessive granulation tissue, which is controlled by chemical cauterization.



Fig. 19—Six weeks later. Patient still under treatment shows slow progress.

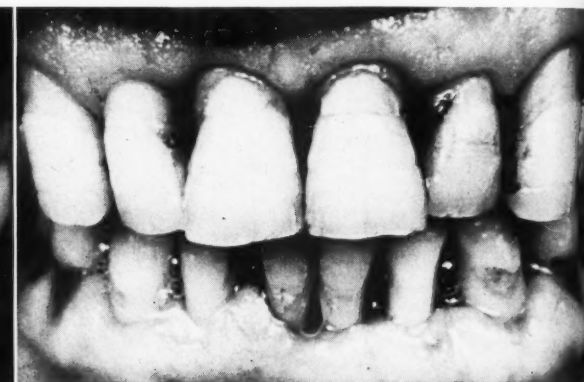


Fig. 20—Preoperative view of case; patient, aged 50. Periodontitis associated with oral sepsis. Teeth are loose; pockets deep with pus discharging readily. Patient in good health.

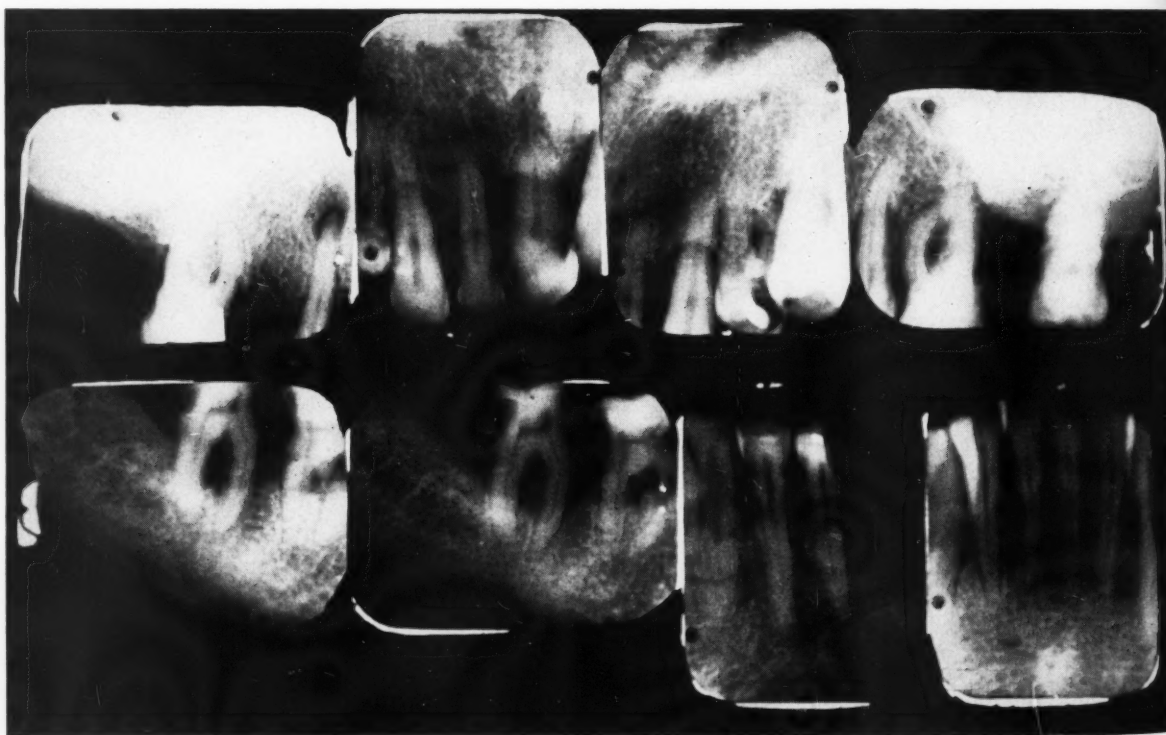
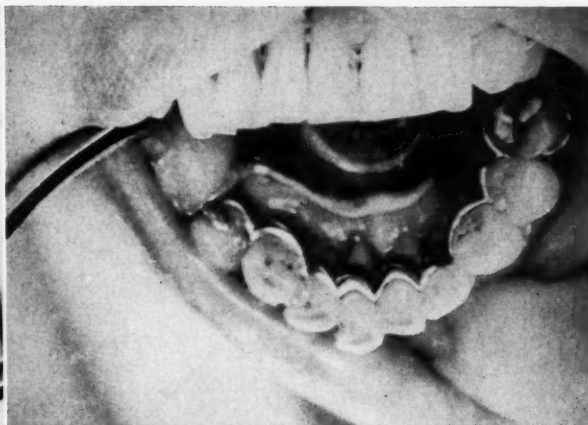


Fig. 21—Preoperative roentgenograms.



Fig. 22—Three years later, after periodic conservative treatment, with little or no progress. A lingual bar appliance is constructed to



give upper posterior teeth needed exercise, with resulting firmness. Fig. 23—Same appliance after prophylactic treatment.



Fig. 24

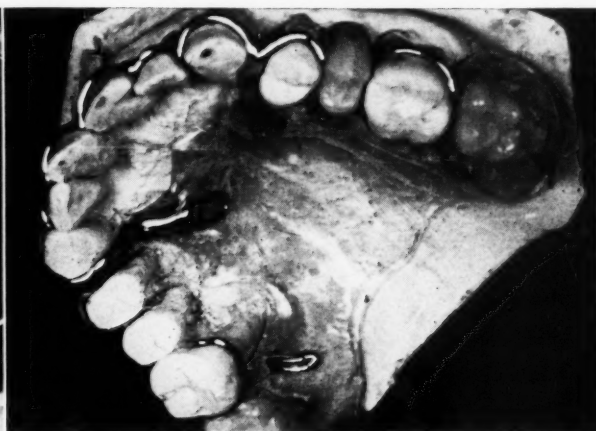


Fig. 25

periodontal infections have received secondary consideration. The latter may be a potent factor in the dissemination of infection into the blood vascular or lymphatic systems by absorption, by inhalation into the lungs, or by being directly ingested into the gastro-intestinal tract. The elimination of periodontal disease by the radical removal of all teeth may cause immediate and serious nutritional disturbances, depriving the patient of the masticatory apparatus during the period of transition to dentures.

Conservative treatment of periodontitis by subgingival curettage and medication serves to reduce active symptoms, but if the pocket is not eliminated, such treatment proves to be inadequate. Surgical gingivoplasty, gingivectomy, electro-surgical resection or limited escharotic medication is indicated for the positive eradication of the pocket by

Fig. 24—Gums are electro-surgically resected in three sections (upper jaw). Three weeks later with wire splint in place.

Fig. 25—Permanent removable upper splint of cast chrome-alloy labial bar attached to acrylic base; three missing teeth also restored.



Fig. 26—Anterior view of appliance. Left lower anterior region shows healing following a recent resection. Teeth are now comfortable and efficient in mastication. Labial bar affords support against outward pressure. Lingual continuous clasp bar affords protection against inward pressure. Patient is advised to wear appliances constantly. It is especially important to wear them during mastication.

the destruction of its soft tissue side; thus masticatory function is retained while foci of infection are promptly eliminated without undue trauma.

The desired biologic results in these methods are the formation of deflecting contours and clear interproximal sluiceways. These objectives simulate Na-



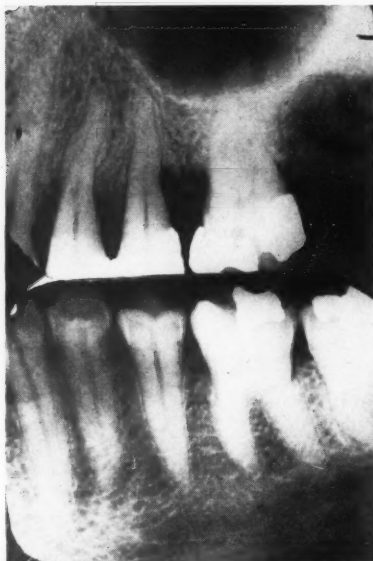


Fig. 27—Roentgenograms show extent of loss in bone attachment. Clinically, second bicuspid is loose. There is marked separation between molar and second bicuspid.

ture's physiologic recession (Fig. 3). The tissues are then kept healthy by daily massage. The interproximal spaces are kept scrupulously clean by silk floss and the rubber-tipped interdental stimulator. Other means, such as pipe cleaner strips, sterilized by the autoclave, may be used.

During the period of treatment and tissue repair poorly supported teeth must be protected against undue stress and further luxation and wandering. Splints and other means of fixation are indicated (Figs. 4, 5, 6).

### Splints

Splinting appliances for stabilization and fixation are either of the stationary or removable types. The removable type, constructed of the light weight but extremely rigid chrome-alloys, is preferred for reasons of accurate fit and sanitation (Figs. 7, 8, 9, 10). The case

is carefully surveyed and the appliance correctly designed to support and stabilize each individual tooth. Missing teeth are replaced in both jaws. The splinting principle is also utilized in prosthetics. Continuous clasps, occlusal rests, embrasure arms, and indirect rests are incorporated in the appliance to prevent future periodontal disease (Figs. 11 and 12).

The initial use of surgical cement pack serves as a temporary splint, but for more effective comfort to the patient and stabilization of irritated teeth immediately after the removal of the pack a temporary splint is quickly inserted by weaving stainless steel wire, .010 DIA, around each tooth with a twist given at each interdental space. The weaker teeth are thus supported by the firmer ones. Such a splint may be used for about a month, and is replaced later



Fig. 28—Acrylic jacket crown with attached rest fitted into recess of interproximal restoration of molar. Lost contact point is restored. Tooth is firmer.



Fig. 29—Periodontitis in a woman, aged 28 years. Contributory causes are malocclusion and deficiency disease.

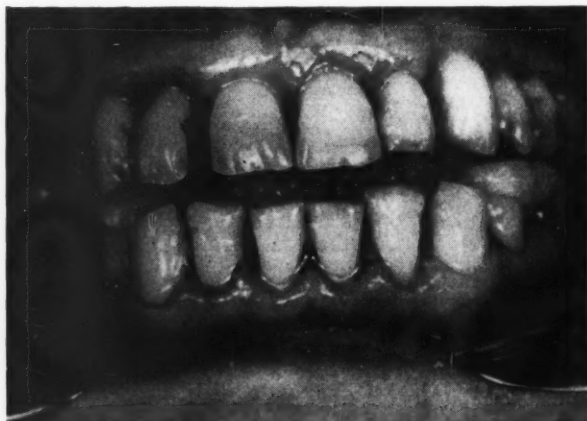


Fig. 30—Posterior bite blocks in place.

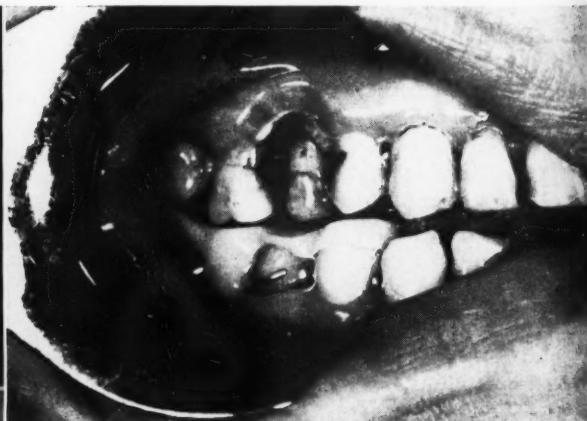


Fig. 31—Resection of tissue in right maxilla. Silver nitrate applied to second bicuspid area.



Fig. 32—Electrosurgical resection of left side.

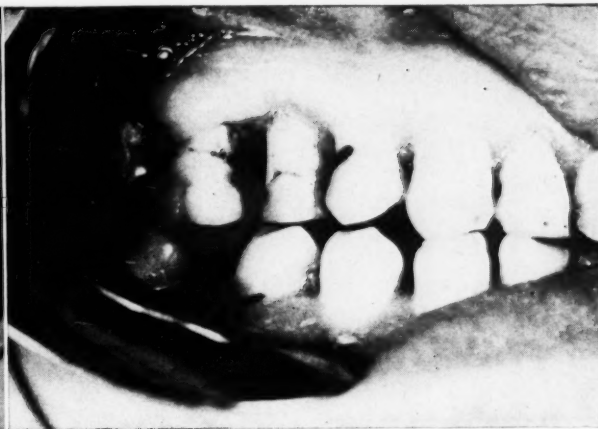
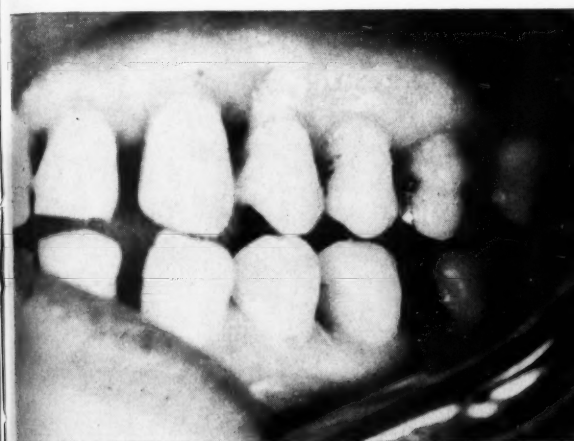


Fig. 33



Figs. 33 and 34—Postoperative results in six weeks. (Silver nitrate stains polished off.)

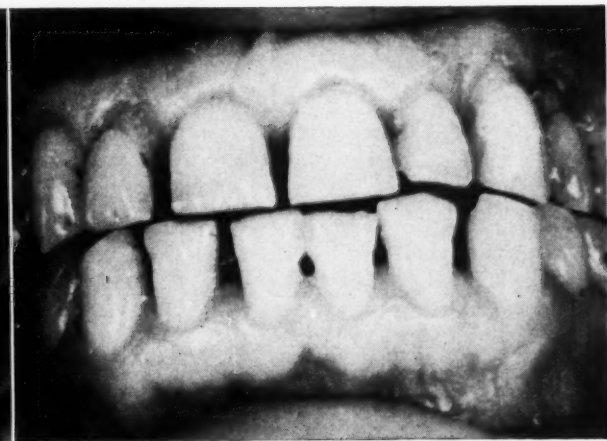


Fig. 35—Bite opening appliance eliminated. Note present position of teeth in centric occlusion, with no overbite. Compare with Fig. 29.



Fig. 36—Photograph reproduced from color plate, DENTAL DIGEST, September, 1940, "Schmutzpyorrhea." Etiology: local and organic disease.

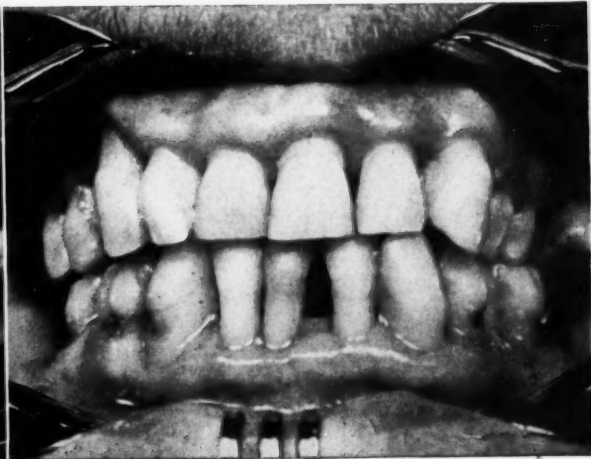


Fig. 37—Six months later following extensive electrosurgical and drug therapy. Teeth were ground to balance occlusion. (DENTAL DIGEST, September, 1940.)

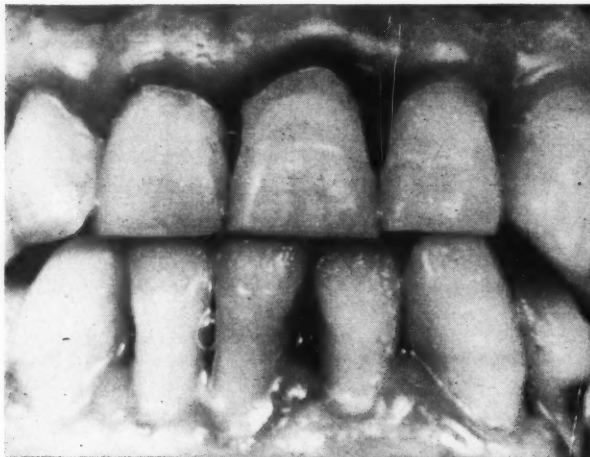


Fig. 38—One year after Fig. 37.

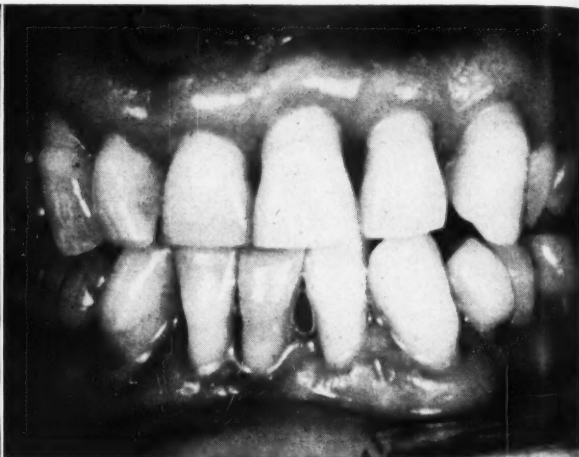


Fig. 39—One year after Fig. 38.

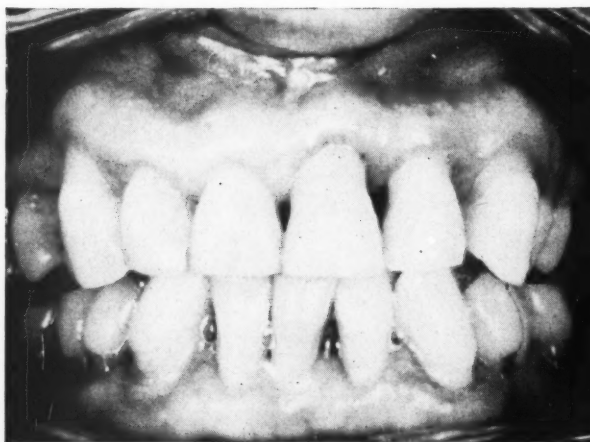


Fig. 40—One year after Fig. 39. It will be noted that clinical results as seen in Fig. 37 have not varied for more than three years, except that the lower bicuspids and molars are now mobile. There are no pockets present but apparently these teeth are held by fibrous



union. All other teeth are firm. Patient faithfully reports for periodic treatment.

Fig. 41—Periodontosis of unknown etiology. Wire splint following resection.

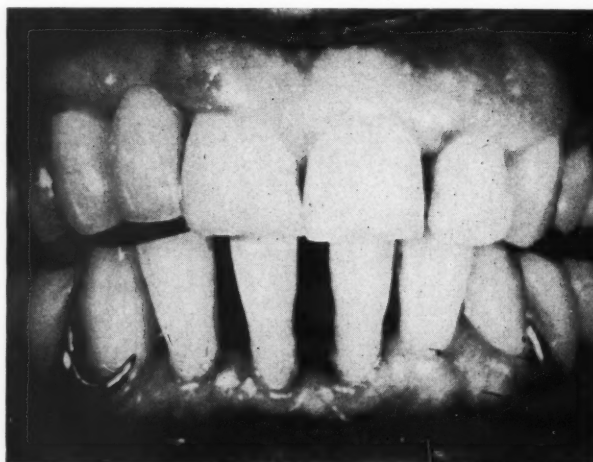


Fig. 42—Upper partial denture restoration. (Porcelain jacket crown on right cuspid.) Lower lingual bar restoration with lingual support for weak incisors.

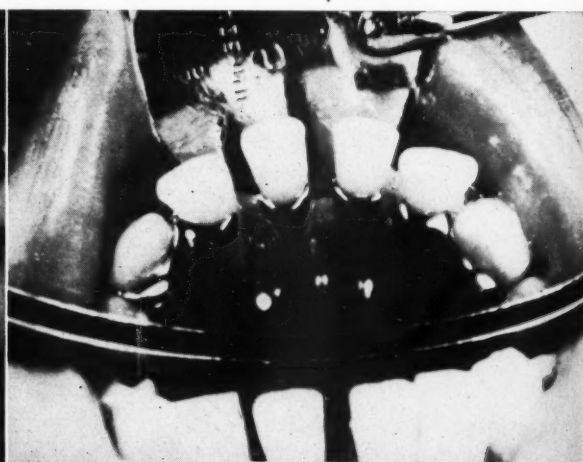


Fig. 43—Lingual view of same case showing individual arms, made of rigid chrome-alloy, acting as splint.



by a removable splint (Figs. 12 through 26).

If bone attachments are not sufficient or a fibrous union has resulted, a splint may have to be worn indefinitely. Individual teeth may be stabilized by slot arrangements in interproximal inlays or by rests on adjoining teeth (Figs. 27 and 28). Complicated fixed arrangements should not be used inasmuch as they are difficult to keep clean. Teeth are not to be stabilized at the expense of the health of soft tissue.

### Occlusal Trauma

The shortening of the clinical crown may be indicated to reduce leverage and forceful impact. Occlusal grinding is guided by studying articulated models and referring to roentgenograms. With the aid of articulating paper and finger palpation, high spots are located, and cusps and planes are ground for the correction of occlusal trauma and to establish a nearly balanced articulation. Faulty contact points are corrected by new restorations. Unsanitary and ill-constructed bridges are remade.

The balancing of occlusion may require insertion of bite-opening appliances or the building of the teeth with



Fig. 44—Appliance on model.

onlays (Figs. 29 through 35). Traumatic influences are neutralized by reducing cusps and acute cuspal planes.

Faulty habits likewise must be corrected and early orthodontic treatment undertaken.

### Patient Education

A pertinent factor in the management of periodontosis is patient education. Applied psychology plays an important rôle. Visual education serves to

convey to the patient possibilities and limitations. The condition usually having been neglected, many a patient has a defeatist attitude, although there are also those who will refuse to part with hopelessly detached teeth. Somewhere between the two extremes may be found the receptive person for whom good service may be performed with results usually gratifying to both patient and operator (Figs. 36 through 44).

*Walnut Park Plaza.*

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## Letters of Clinical Interest

Regarding the article by Lieutenant Rexford Stearns in the May issue of *The DENTAL DIGEST* (REPAIRING A BROKEN BRIDGE FACING, page 202), I wish to point out that sometimes the holes in the backings are countersunk, and even hydrocolloid likes to remain in them.

When a gold wire staple is used with an acrylic facing, if the wire were fitted in the mouth and the impression then taken, one step would be saved and the same result obtained.—*Fred W. Allen, D.M.D., 520 Beacon Street, Boston.*

In the last May issue of *The DENTAL DIGEST*, L. J. Pereira, Jr. describes his method of treating a case of acute pericoronitis involving the lower third molar (THE LOCAL USE OF SULFANILAMIDE, page 229). Doctor Pereira says that when his patient, after having been seen once, returned the following day for treatment, inflammation of the pericoronal tissues and slight trismus were in evidence. The case was treated by completely removing (apparently excising) the flap over the third molar. This was followed by packing the pocket distally to the tooth with granulated sulfanilamide. When the patient returned in forty-eight hours, the condition is reported to have been found decidedly improved.

I am prompted to object. In treating cases of pericoronitis, only the most conservative approach should be followed regardless of the type of medication employed. Many cases will im-

prove despite radical methods; however, it is also true that such radical procedures not infrequently lead to grave complications.

An acute or semi-acute pericoronitis may appear at first glance as a comparatively innocuous condition, but because of the frequently low resistance of the tissues involved and the occasional highly virulent type of micro-organisms in this region, there is always the probability that serious complications may follow radical treatment. Even fatal results have been reported, and this, regardless of the use of the sulfonamides.

The watchword should be, "Go slow and be on guard."—*Matthew Lozier, D.D.S., 369 East 149th Street, New York City.*

# Prolonged Bleeding Following the Extraction of Abscessed Teeth

JOSEF NOVITZKY, D.D.S., San Francisco

PROLONGED BLEEDING following the extraction of abscessed teeth appears to be fairly common. The bleeding is thought to be due to a blood dyscrasia or to other systemic conditions promoting bleeding. This opinion prevails despite the fact that examination of blood specimens fails to support it. It is true that slow clotting time is frequently found; but this fails to explain the protracted bleeding, for the blood does clot; in fact, the mouth becomes more or less filled with clot, but deep in the tooth socket, the clot fails to form.

## Local Conditions Affecting Clot Formation in Depth of Tooth Socket

Systemic conditions favoring bleeding are with two exceptions omitted from this discussion. These two conditions are encountered both systemically and locally. The systemic conditions may be witnessed in patients exhausted by sickness and in those lacking muscular and vascular tone. Tooth extractions in those patients may be followed by persistent oozing of blood. This may be particularly marked following certain types of streptococcal infections and in the influenzas. Not only is there a lack of tone during convalescence from these infections, but also the infection has an undoubted hemolytic action on the red blood corpuscles.

Similar conditions are encountered in the streptococcal granulations at the root ends of abscessed teeth. In this chronic inflammatory tissue there are two more or less localized causes of bleeding comparable to the systemic conditions that promote bleeding: first, the infection, which is usually a hemolytic streptococcus, and second, a definite absence of contractile power in the blood vessels of the inflammatory tissue.

## Dental Granulomas

A granuloma is the proliferation of

## DIGEST

1. The principle object of this article is to call attention to the strictly local conditions in the dental field influencing postoperative bleeding.

2. Postoperative bleeding lasting many hours or days is usually pathognomonic of improper or incomplete surgery.

3. The diagnosis of improper surgery may be confirmed by the presence of postoperative elevation of the normal body temperature.

4. Extractions of abscessed teeth, in the light of modern scientific knowledge, should be regarded as improper, incomplete surgery.

5. Proper surgery calls for an open operation and removal of the abscess tissue with the tooth.

6. Chronicity of the infection is important. Bone surgery may be postponed, and should not be carried out in the presence of an acute, diffuse infection.

7. The procedure of choice calls for incision, drainage, and hot wet applications until fibrin has formed around the region. Bone surgery may then be undertaken with safety to the patient.

exuberant granulation tissue into the hole in the alveolar process resulting from pressure necrosis. Tissue undergoing the chronic irritation from infection may react by a proliferation of distorted, immature blood vessels and the degeneration of the connective tissue matrix almost as rapidly as it forms. This results in areas of suppuration. Pus cells and leakage of blood fluids and solids from the blood vessels occur. If the inflammatory reaction becomes less active the circulation of blood is retarded and partial calcification of the granulation tissue may follow. The blood fluids are carried away by the lymphatics, but the solids remain as structureless calcified debris; that is, a calcification. Under the microscope calcification in bone is shown to be lacking in the orderly laying down of bone lamellae and the formation of Haversian systems. Calcification is clearly a retrograde process, and should not be confused with ossification which is the orderly physiologic formation of normal bone. Such calcification is Nature's attempt to wall off the area from the circulation.

The lack of vasomotor mechanism in the blood vessels of a granuloma is due to certain facts in its evolution. Blood vessels existed before vasomotor nerves developed. If immature blood vessels in inflammatory tissue did not grow faster than sympathetic nerves, and if the power to contract were present in these vessels, contraction would squeeze the septic fluids from the granuloma into the circulations of the body. Inflammatory new growths, scar tissue, and blood vessels in the nevus are among the structures lacking in vasomotor innervation. The forces of evolution are evident in the growth of tissues. Various primitive tissues, of which connective tissue is one, grow readily. Other more recent and highly specialized tissues grow slowly, if at all. A fair comparison of inequality of growth in related tissues

is seen in mucous membrane at one extreme and muscle tissue at the other. The first proliferates readily and may become exuberant; the second heals by scar tissue and contracts. Loss in muscle tissue is compensated for by a hypertrophy through use. The more highly specialized a tissue becomes, the slower it will regenerate following injury. Nerve tissue, a highly specialized tissue, regenerates with difficulty. The forces of evolution are present in the growth of a granuloma and they are present in other growths. The primitive reproduction by subdivision, the reproduction lacking the excitement of sex, is undoubtedly a factor in the production of a malignant growth. Malignancy is probably fundamentally a biologic hold-over activated by bacterial irritants.

#### **Postextraction Bleeding**

Extracting abscessed teeth and allow-

ing a granuloma, or worse, a part of a granuloma, to remain in the socket may be followed by (1) persistent bleeding and (2) fever. These sequelae are related to the chronicity of a granuloma. The inflammatory stage of the tissue is reflected not only in the bleeding but also in the systemic reactions following tooth extraction.

The appearance of the part in the roentgenogram is indicative of whether or not Nature's attempt at defense has had time or ability to function. If the roentgenogram indicates that the inflammatory tissue is more or less surrounded by a shell resembling cortical bone, one may confidently feel that there is little danger of systemic sequelae following proper surgery.

It is fortunate that eburnation, or a condensing osteitis, is commonly present around dental granulomas. When a rarefying osteitis is seen in the roent-

genogram, there is either an acute inflammatory involvement or a case wherein the vitality of the patient is not adequate to retard the spread of infection. In these cases surgical judgment is essential for the welfare of the patient, and, as in the surgical approach in cases complicated with a phlegmon of the overlying soft tissues, surgical intervention should be restricted to obtaining adequate drainage until such time as the diffuse infection has become well limited by natural body defenses.

In cases in which cortical bone surrounds the granuloma, if the growth is removed completely down to the normal small blood vessels coming through the eburnated shell at the time the tooth is removed, bleeding will stop through the automatic physiologic contractions in the normal blood vessels.

909 Hyde Street.

### **Announcement of Books Received**

- OPERATIVE ORAL SURGERY, By Leo Winter, D.D.S., M.D., Sc.D., Second Edition, St. Louis, The C. V. Mosby Company, 1943.
- PARTIAL DENTURE CONSTRUCTION, By Edward Kennedy, D.D.S., Second Edition, Brooklyn, Dental Items of Interest Publishing Co., Inc., 1942.
- ENAMELOID ACRYLICS, By Maurice N. Stern, D.D.S., Forest Hills, L. I., The Credo Publishing Co., 1942.
- TEXTBOOK OF PERIODONTIA (ORAL MEDICINE), By Samuel Charles Miller, D.D.S., Second Edition, Philadelphia, The Blakiston Company, 1943.
- AN EVALUATION OF DENTAL HEALTH LITERATURE, By Vern D. Irwin, D.D.S., M.P.H., Director and Netta W. Wilson, M.A., Saint Paul and Minneapolis, Bruce Publishing Company, 1942.
- LABORATORY DIRECTIONS IN BIOCHEMISTRY, By Victor C. Myers, M.D., Ph. D., D.Sc., St. Louis, The C. V. Mosby Company, 1942.
- PERIODONTIA, By Henry M. Goldman, D.M.D., St. Louis, The C. V. Mosby Company, 1942.
- PRACTICAL ORTHODONTICS, By Martin Dewey, D.D.S., M.D., Revised by George M. Anderson, D.D.S. Chapters by Bernhard Wolf Weinberger, B. Holly Broadbent, Harry E. Kelsey, Rudolf Kronfeld, Alfred Paul Rogers, Earl W. Swinehart, Chester F. Wright, Edward A. Kitlowski. Contributions by Sidney Riesner and E. B. Arnold. Sixth Revised Edition, St. Louis, The C. V. Mosby Company, 1942.
- MANUAL OF INDUSTRIAL HYGIENE and Medical Service in War Industries, Edited by William M. Gafafer, D.Sc., Prepared by the Division of Industrial Hygiene, National Institute of Health, United States Public Health Service, Philadelphia and London, W. B. Saunders Company, 1943.
- PROFESSIONAL DENTISTRY IN AMERICAN SOCIETY, By Alfred J. Asgis, M.A., Ph.D., D.D.S., Limited Edition, New York, Clinical Press, 1941.
- CYCLOPEDIA MEDICAL DICTIONARY, Including A Digest of Medical Subjects, By Clarence Wilbur Taber and Associates, Second Edition, Philadelphia, F. A. Davis Company, 1943.



# Mandibular Impressions for Full Lower Dentures

JACOB J. STARK, D.D.S., Brooklyn, New York

## DIGEST

By digital examination of the mouth the operator acquaints himself with the anatomic structures beneath the mucous membrane: their character, size, shape, and relationship when relaxed and when in function.

With a high-fusing compound a preliminary impression is made to record the shape, form, character of the alveolar ridges, external and internal oblique ridges, and angulation of the rami to the body of the mandible. The plaster cast of this impression is usually larger than the final cast; it will register the deepest position of the buccal and lingual folds.

The impression is taken with a soft material that will stay soft enough to register each physiologic function, and will become hard enough when completed to withstand vibration or the packing of a stone cast into it without changes in form. The method of doing this is outlined and illustrated.

A DIGITAL AND visual examination of the mouth will acquaint the operator with the anatomic structures: their character, size, shape, and relationship when relaxed and when in function. All true anatomic structures are hidden beneath the mucous membrane. By passing the index finger over the anterior alveolar ridge with gentle pressure, it may be determined whether the ridge is knife-

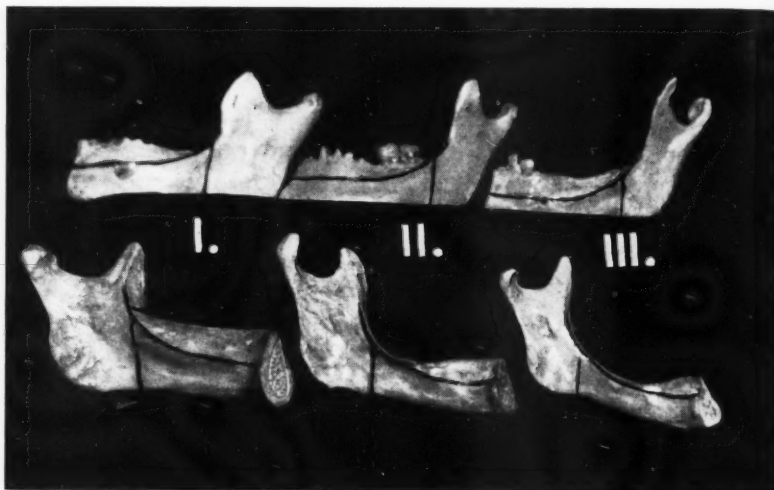


Fig. 1—Anatomically the mandible is divided into horizontal and vertical portions: the body and rami. The body is again divided by the external and internal oblique lines forming ridges. All muscle attachments take place at or below these ridges: the buccinator at the external and the mylohyoid at the internal ridges.

By prolonged waiting for denture replacement after extraction of teeth, or alveoclasia, the alveolar ridges diminish in height or may entirely disappear; the form of the mandible, angulation of body and rami, as well as the character of the muscles and their attachments may also change.

Horizontal lines show muscle attachments and location of external and internal oblique ridges, and residual alveolar ridges. Vertical lines externally are at the points where the buccinator muscles cross the mandible; internally where the pterygomandibular ligaments unite the buccinator and superior constrictor muscles. These lines also denote the angulation of the body to the ramus.

Mandibles are divided into three classes: (I) a high residual alveolar ridge with the angle of body and rami almost at right angles; (II) residual alveolar ridge greatly diminished and body and rami angles wider; (III) alveolar ridge has entirely disappeared and there is an obtuse angle of body and rami. The angulation of the rami to the body is important as the rami give the wall support to the denture posteriorly.

like sharp or round. Passing the finger to the muco-labial fold, the ridge may be felt as high or shallow. There may be a high frenum, flabby gums. A high lingual frenum may likewise be found. Passing the finger posteriorly and from side to side the operator may determine the character of the residual alveolar ridge, its sharpness or roundness, the height of the mylohyoid ridge, the character of the external oblique ridge; the thickness and resistance of the muscles; the angulation of the rami with respect to the body of the mandible; and the size and shape of the tongue and height of the floor of the mouth and sublingual glands.

The angulation of the rami and body

of the mandible as well as the verticle relationship of the ridges and temporal articulation may vary on the two sides in the same person.

## Preliminary Impression

The preliminary impression is made with a somewhat larger tray, one that will extend about half an inch up the rami, and will be deeper and wider than the ridge of the mandible. A high-fusing compound is used. This impression will push away the muscles and record the shape, form, character of the alveolar ridges, external and internal oblique ridges, and angulation of the rami to the body of the mandible.

If the impression records deep under-

cuts under the mylohyoid ridges, it is advisable to cut away these extensions in the impression before the plaster cast is made.

The plaster cast of such an impression is usually larger than the final cast; however, it will register the deepest position of the buccal and lingual folds and a true record of the classification of the mandible.

### Trimming of Vulcanite Tray

After the cast of the preliminary impression is obtained a vulcanite tray is made. The tray is fitted in the mouth until it lies easily in the mouth. Gently place the index fingers over the right and left side of the tray, having the patient go through the motions as herein-after described.

Make another digital examination of the anatomic structures in function, then place the tray in the mouth. When the patient goes through the same functions, the tray will be dislodged. The vulcanite tray must be trimmed, so that the patient will be able to go through the various functions of the oral cavity without displacing the tray. Place the tray in the mouth and have the patient place the tongue into the opposite cheek (right cheek); this will displace the tray on the left side. When the superior constrictor muscle moves forward, the mylohyoid muscle will also be raised. The tray is cut in this region until this movement of the tongue will not affect the seat of the tray. Push in the cheek of the same side and trim the distal margin of the tray until it fits into the buccinator fold without displacement. The disto-lingual flange of the tray should not extend over the pterygomandibular ligament.

The patient is asked to thrust the tongue into the left cheek, so that the dentist may proceed in the same manner as on the left side.

After the tray has been comfortably fitted in the posterior-lingual regions, both right and left, the anterior lingual portion of the tray is trimmed by asking the patient to raise the tongue to the roof of the mouth or lick the lower lip from side to side.

To trim the labial portion of the tray, press in the lower lip or ask the patient to suck in the lower lip.

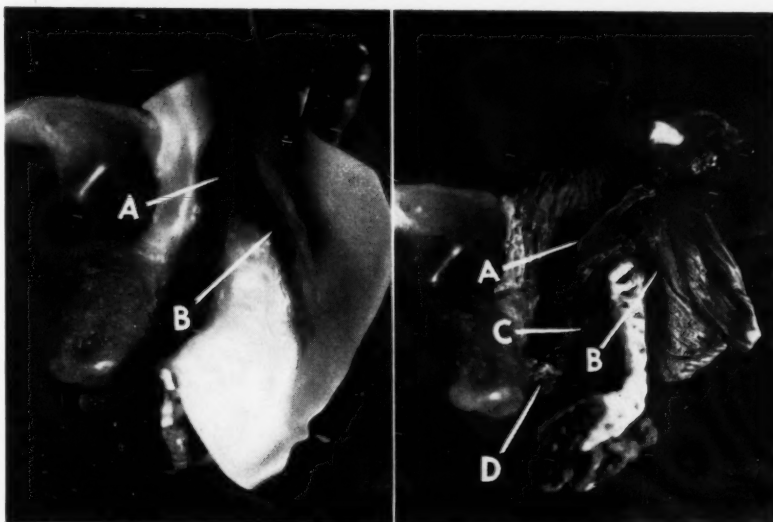


Fig. 2—A, Pouch-like formation in posterior portion of sublingual space; B, buccinator fold created by the buccinator muscle as it crosses mandible. This specimen is as it is observed in the oral cavity.

Fig. 3—Same specimen with the mucosa removed: A, the posterior lingual pouch; B, buccinator fold; C, mylohyoid attachment; D, sublingual gland.

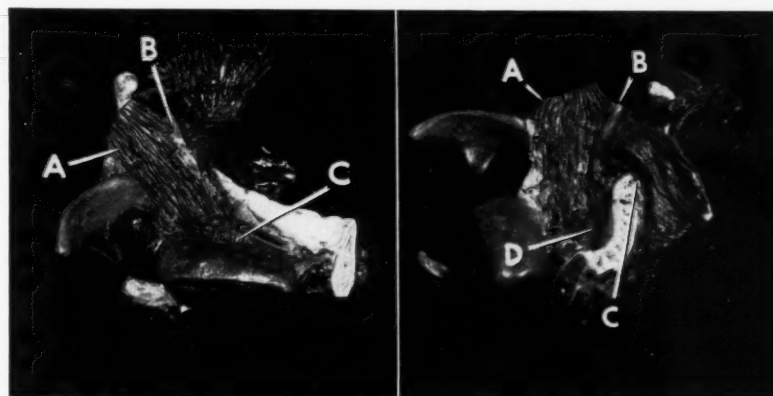


Fig. 4—Lateral view of posterior sublingual space with tongue deflected into opposite cheek. Pouch-like formation disappears bringing superior constrictor, A, forward; B, the pterygomandibular ligament; C, mylohyoid muscle.

Fig. 5—Front view of Fig. 4. Compare with Fig. 3.

To trim the buccal flanges the patient is asked to suck in his cheeks, or, the dentist may depress the center of the cheek. This is done alternately.

### Impression Taking

1. Having trimmed the vulcanite tray, the impression is taken with a soft material that will stay soft enough to register each physiologic function, as described in the trimming of the tray, and will become hard enough when completed to withstand vibration or the packing of a stone cast into it without changes in form.

2. The tray is spotted with compound so as to raise it for the bulk of the impression material.

3. The tray is filled with the material selected, preferably a low-fusing compound or impression wax or paste which will give enough time to muscle-trim and can be made hard enough to register each step separately. The same order is followed in the tray-trimming: First place the tray and material into the mouth to take a centric position.

4. After it has been removed and is found to be centrally placed, the tray is put back in the mouth and the region



Fig. 6

Fig. 6—Relationship of half of impression to anatomic structures: A, Disto-lingual margin extends up to the pterygomandibular ligament; B, conforms to mylohyoid muscle when tongue is deflected into opposite side of mouth; C, disto-buccal flange fits under the buccinator as it folds across the mandible.

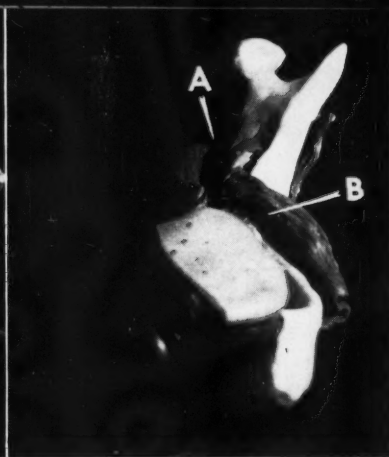


Fig. 7

Fig. 7—Close view of A, posterior lingual pouch, and B, buccinator fold.

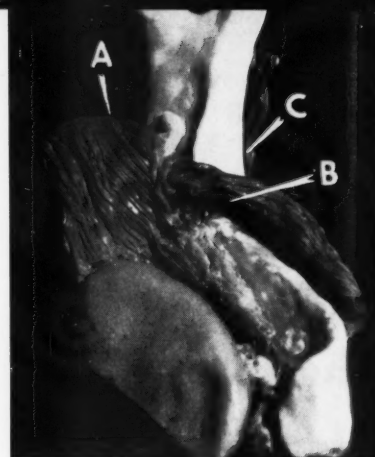
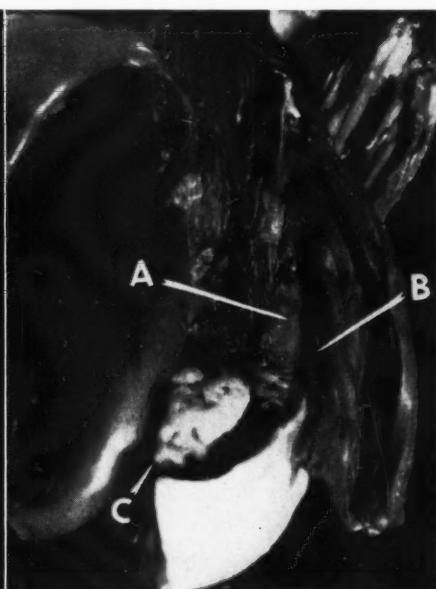
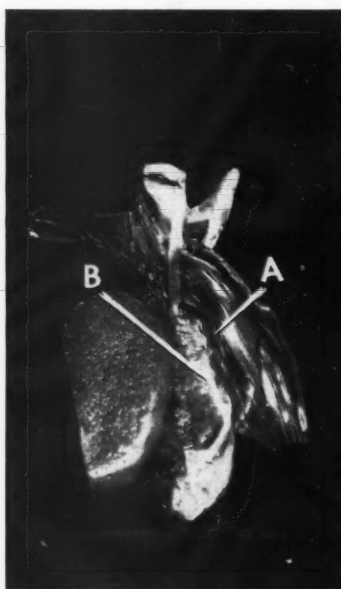


Fig. 8

Fig. 8—Close view of elimination of A, lingual pouch, by deflecting the tongue, but the buccinator fold (B) is not eliminated; in back of it (C) is the anterior margin of the masseter muscle which is important in impression taking.



Figs. 9 and 10—Meeting of buccinator, mylohyoid and superior constrictor across the alveolar ridge, A; high buccinator attachment, B, and large sublingual gland, C.

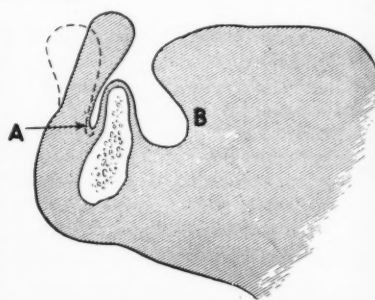


Fig. 13—A, Lip pulled up and overcompressed, creating a short and too thin labial margin. B, Lingual space is too wide, and lingual margin of denture is finished arbitrarily.

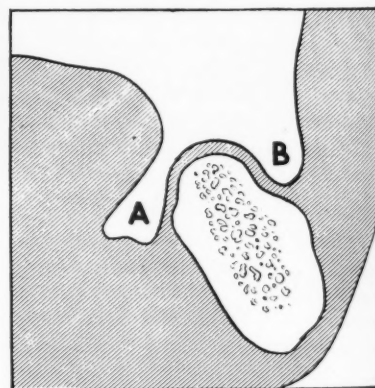


Fig. 14—A, Normal lingual space. B, Normal buccal space in molar region.

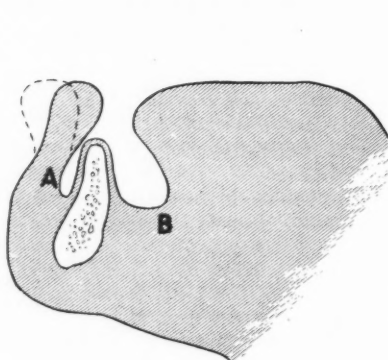


Fig. 11—A, Position of lip in muscle-trimming labial margin of impression. B, normal lingual space with tongue relaxed.

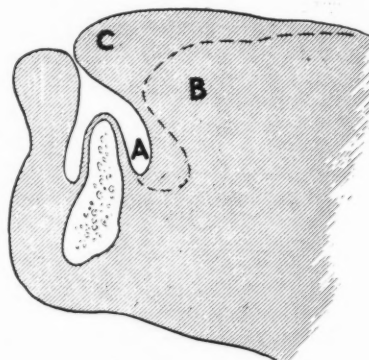


Fig. 12—A, Lingual space for muscle-trimming of lingual flange of impression when tongue is protruded from position B to C.

of the oral cavity to be muscle-trimmed is registered by warming the margin in the region to be molded.

If the compound is too hard the mylohyoid region may be overcompressed. Massaging or pulling the cheek or lip may make the flange short and thin.

5. With the impression completed,



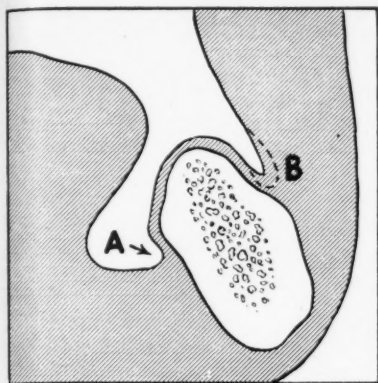


Fig. 15—A, Physiologic lingual space of muscle-trimming impression when tongue is thrust into opposite cheek. B, Buccinator space when cheek is sucked inward to create the buccal flange of impression. Compare with Fig. 14.

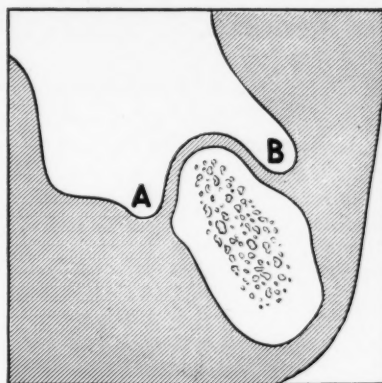


Fig. 16—A, Overcompressed mylohyoid muscle resulting from an impression material that was too stiff. B, Cheek pulled and compressed. This will create a too short and sharp margin of denture in the buccal region with poor adaptation. Lingual margin will be too long and irritate mylohyoid muscle.

postdam the flange in the regions of flabby or vibrating musculature—usually the posterior lingual pouch or mylohyoid surface. The finished flange of the impression should be at least 2 mm.

thick and smooth enough to be tolerable and seal the tissues.

6. Box the impression so as to retain a trough-like space.

1522 President Street.

## A New Bactericide

[From the Army and Navy Journal 80:1244 (June 26, 1943).]

"Medical Department—Development of the new drug penicillin, the green mold culture which bids fair to compete with the sulfa drugs in the treatment of wound infections, was described recently at a hearing on the National War Agencies Appropriation Bill for 1944.

"An official of the Office of Scientific Research and Development described its application in various cases of casualties returned from the Pacific area. One case that had resisted treatment by other known means for 14 months was healed after 27 days' use of penicillin. This case has so im-

pressed the Surgeon General that a project to utilize the preparation and study its effects has been set up at Halloran Hospital, Staten Island.

"The official also stated that in the experimental treatment of gonorrhea penicillin had cleared up the infection in 2 days' time, and a report has been made on 68 cases without a miss.

"On the scale at which it is produced to date, penicillin is undoubtedly expensive, but he stated, if quantity production can be accomplished it will be possible to produce it as a very reasonable figure."

[From The British Dental Journal, 74:241 (May 7) 1943.]

PENICILLIN is a mold broth filtrate obtained from *penicilium rubrum*. It was discovered by Professor Alexander Fleming in 1928 when he found his cultures covered with this mold. He saw that in the moldy area the germs had ceased to grow. A culture of the mold revealed, during the process of spore

formation, a bright orange dye, the mold broth filtrate which he called penicillin. Its composition is still unknown.

Penicillin is insoluble in ether and chloroform, and resists boiling. It is active at pH 8 but above that is unstable. The addition of glucose or saccharose producing acid fermentation prevents

the production of the antibacterial substance.

Although penicillin has the power of inhibiting the growth of many bacteria, it is selective. This selective character facilitates the production of pure cultures by the destruction of those microbes which are sensitive to it, leaving insensitive ones to develop. Penicillin inhibits staphylococci, whether or not pus is present, and can be applied to suppurating wounds; hemolytic streptococci are inhibited in a dilution of 1 in 800,000 of penicillin as compared with 1 in 200,000 sulphathiazole. Bacilli of the diphtheritic group and anthrax are very sensitive to it, but some of the gram negative cocci in the mouth are unaffected by it and it has no effect on the bacillus of influenza. It is remarkable for its activity against anaerobes associated with gas gangrene.

Penicillin is non-toxic and non-irritating. It does not interfere with the action of the leukocytes. It is not related to any of the chemotherapeutic substances at present in use.



**ARE YOU  
BUYING  
WAR  
BONDS**

# Postoperative Care of Extraction Wounds

FRED D. MILLER, D.D.S., Altoona, Pennsylvania

## DIGEST

Postoperative care of extraction wounds is discussed with this innovation suggested: The use of Dryfoil to cover the socket so as to protect the blood clot.

DEFENSE WORKERS, busy civilians, service men who must have teeth extracted should not have to make return visits to the dentist. Those frequent visits can be prevented by exercising a little more care, being a little more gentle, and taking a little more time for the operation. Patients need not suffer pain before, during or after an extraction.

### Prevention of Postoperative Complications

1. Anesthesia must be complete and unhurried.

2. Prevent trauma. The extraction of a tooth is a delicate operation, and must not be performed by brute strength. Apply force only in the right direction, and gently, skillfully.

3. Keep the field of operation isolated and free from saliva following the removal of the tooth. Do not allow the patient to spit out or rinse the mouth. Keep the sockets covered with gauze packs and cotton rolls until a well organized blood clot forms. Keep the gauze or cotton away from direct contact with the socket, so that blood will not be absorbed into cotton. Prop the jaws open. Coagulation time varies from 2 to 12 minutes. Keep the area free from saliva until the socket has a good blood clot, which is Nature's protection and should not be disturbed.

4. Protect the blood clot. Sprinkle a little sulfanilamide or sulfathiazole over the blood clot rather than fill the socket with the drug. Cover the socket and the adjacent teeth with Dryfoil, a sticky tin foil which was originated to cover silicate restorations but which is more valuable in keeping the blood clot and the sulfa drug in place and undisturbed by



Fig. 1—Application of Dryfoil to cover socket of upper tooth.

food, the tongue, and mouthwashes.

5. Instruct the patient to do nothing to disturb this blood clot, to use no mouthwashes, make no suction on the socket, to keep the tongue away from the socket. The teeth may be brushed

and the mouth should be kept clean, to be sure.

6. Instruct the patient to come in the following day when the condition of the socket should be examined. The tin-foil cover (Dryfoil) is to be left in place

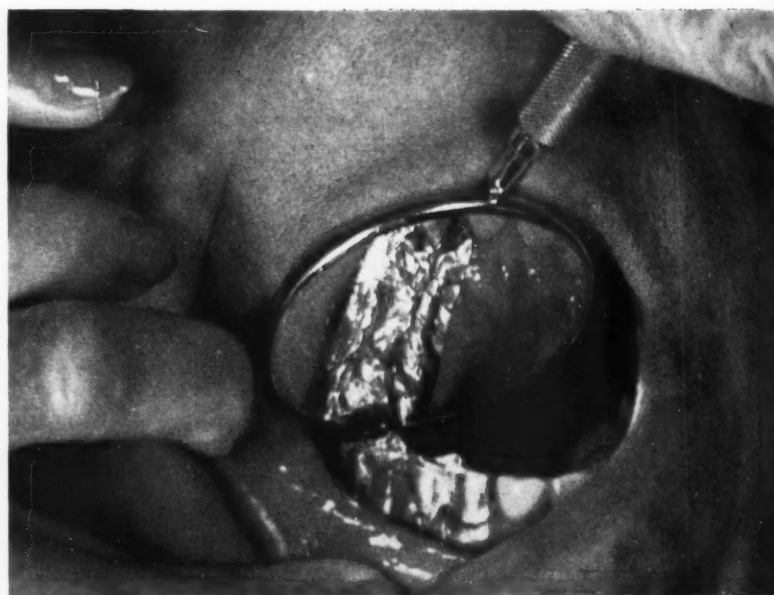


Fig. 2—Dryfoil covering socket of lower tooth.

even until the following day if it will stay.

7. The patient should be instructed to inform the dentist *at once* in the event of pain.

#### **Dry Socket**

1. If a dry socket does occur despite all precautions, irrigate with warm nor-

mal salt solution, and isolate with cotton rolls.

2. Explore with a number 17 explorer to be sure that no foreign matter is present.

3. Apply phenol to cauterize.

4. Place a cone of zinc oxide and eugenol mixed to a stiff paste in the socket, but be careful not to get it into

an undercut or another "root" will have to be removed. Cover with Dryfoil. The zinc oxide and eugenol may remain in the socket for several days.

5. A blood clot must form in the socket; therefore, irrigate, isolate, tease bleeding, keep saliva away, and cover with Dryfoil.

1122 Twelfth Avenue.

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### ***We Can't Pay You, But—***

No dental author can ever be *paid* for a valuable technical or scientific article. The value of such material is above a monetary basis. In the preparation of a technical article, however, an author often expends money for drawings, photographs, models, or graphs. We would like to help defray some of these expenses.

*Until further notice, THE DENTAL DIGEST will allow \$25.00 toward the cost of illustrations provided by the author of every article accepted for publication.*

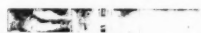
Before the year is out about 20,000 of our dental colleagues will be in military service. Few of them will have the time, the facilities, or the opportunities to develop new techniques or to write for the dental literature. They will be eager, however, to read of the new developments in dental science and art.

Writing articles for publication in technical journals can be a contribution to the war effort, because that is how to help our dental officers in the Army and Navy keep abreast of technical advancements, and it is one way to improve the skill and services of civilian dentists on the home front.

If you have a constructive idea, an innovation, a new result of tried and proved experiment, put it down in writing, illustrate it, and send the material to: The Editor of THE DENTAL DIGEST, 708 Church Street, Evanston, Illinois.

*We hope that you will accept this invitation!*

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#### **THE COVER**

THIS MONTH, at the request of the Treasury Department, hundreds of magazines, including THE DENTAL DIGEST, are using cover designs featuring the American flag. Flag covers were also carried last July, when the Treasury Department first requested their use. The photo shows dental and medical officers participating in ceremonial parades at the Medical Field Service School, Carlisle Barracks, Pennsylvania.



## The Editor's Page

THE EDITOR of the *Journal of the American Medical Association* is given to prophecies. One of his most recent was uttered before the Women's Auxiliary of the American Medical Association on June eighth. In that speech Doctor Morris Fishbein predicted the defeat of that portion of the Wagner-Murray Bill which would provide social security against sickness for the working population. As part of his speech, it is reported, Doctor Fishbein sang his old refrain: "The future of proper medical care in America depends on continued independent civilian control of the medical profession and hospitalization." This is the same theme that Doctor Fishbein has been wedded to for more than a dozen years. In 1932 it was he who in a moment of social fear pronounced a never-to-be-forgotten comment on the Final Report of the Committee on the Costs of Medical Care. He described the recommendations in the report as "communism and socialism—inciting to revolution." Since then the Social Security Act with its many major health provisions has become effective. Group Hospital Plans, activated despite the opposition of the American Medical Association, have been accepted with enthusiasm by millions of people throughout the country. Since 1932 the American Medical Association has been convicted for violating the Sherman Anti-Trust Act and has had some hot moments before Congressional committees. It would appear that Doctor Fishbein is not facile in reading the handwriting on the wall.

No one would deny Doctor Fishbein or anyone else the benign privilege of making prophecies. The Wagner Bill may be defeated. One guess is as good as another. It is unfortunate, however, that in his role of soothsayer, Doctor Fishbein often prejudices the case of medicine with the public. Medicine's public relations are not good. The reaction of the people toward the conviction of the American Medical Association was decidedly unfavorable to medicine. It is not good to have the American public believe that medical care is a monopoly under the control of a group of reactionaries who would oppose attempts to make medical care available to all. Statements, such as those credited to Doctor Fishbein as having been made before the Women's Auxiliary of the American Medical Association, do not raise medicine in the public trust. To say that "the future of proper medical care in America depends on continued independent civilian control of the medical profession and hospitalization" is to suggest that the present system wherein more than 40,000 physicians are in the employ of the government represents a colossal inefficiency and a method of improper med-

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True enough, we must not confuse the present emergency with conditions in a postwar world. We can be reasonably sure, however, that "proper medical care" for millions of Americans, disabled veterans and civilians who will feel the postwar depression, will be supplied by governmental agencies. These people would be pretty discouraged at this time if they were forced to imagine a future wherein the disabled veteran or the needy civilian was left entirely at the mercy of an independent civilian controlled medical profession and system of hospitalization. Regardless of what any group may say or wish, the government will give proper medical care to its sick veterans, and workers will demand and likely receive some measure of health care under an expanded Social Security Act.

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The day following Doctor Fishbein's reactionary speech the House of Delegates of the American Medical Association came to good sense and appointed a Council on Medical Service and Public Relations "to investigate matters pertaining to the economic, social and similar aspects of medical care for all people." The American Dental Association is a year ahead of the American Medical Association in this kind of planning.

During the studies and the deliberations of the Councils of the American Dental Association and the American Medical Association, we hope that no one in either profession will prejudice the case or anticipate the conclusions by speaking too early and out of turn.

# Aerodontia

GLENN E. WILLHELMY, D.D.S., Kansas City, Missouri

## DIGEST

**It is the purpose of this article to summarize the available information on dentistry as related to aviation. To date, little has been done in this field, but the great strides in both military and commercial aviation are certain to present new dental problems. Aerodontia may be a strange term today; but I believe this term will be a familiar one ten years from now.**

TWENTY YEARS ago, in 1923, the first writing on the subject of aerodontia appeared. In that year, H. C. Neblett, who was an Air Corps physician pointed out that apical abscesses and chronic periodontoclasia, either separately or combined, were not an unusual cause of staleness in pilots. Generally speaking, when symptoms and signs of staleness are manifested in a flyer, the cause is not often at first apparent. Later there may be evidence of an acute dental process. In the interim the pilot may be temporarily grounded and kept under observation and treatment for such symptoms as slight headache, dizziness, gastro-intestinal disturbances, loss of appetite, fatigability, and distaste for flying. Neblett pointed out that until the oral infection is located, the cause is usually attributed to excessive flying, overwork in administrative details with close confinement, lack of exercise, and worry from whatever causes.

The following paragraph from Neblett's report is still valid:

In the examination and selection of individuals for pilots, mental and physical perfection in them is essential in so far as is possible to be attained. On the whole, those essentials must conform to a definite standard of examination for all flyers. Yet in the qualification of pilots for the air service, there is no one thing in their physical make-up which is given as little concern as the true condition of their teeth. These, for the

most part, are of interest only in so far as microscopical evidence points to their general condition of soundness and to the required number necessary for the function of mastication. These having fulfilled requirements at the time of the initial examination and acceptance of the pilot, frequently, become diseased later. This is caused principally by neglect on the part of the individual through disregard of personal dental hygiene and lack of a frequent dental survey and treatment. A very broad latitude is therefore allowable relative to general dental requirements and to oral hygiene, with resultant disease of the teeth being frequently manifested. On the other hand, a sinusitis, a deflected septum, diseased tonsils or enlarged turbinates that obstruct the respiratory channels are causes for rejection of the applicant until successfully removed. And for a pilot they may cause temporary disqualification until properly treated. Again, diseased teeth or gums are rarely given attention by those concerned until the local symptoms become so severe that the dental surgeon is consulted for relief and treatment. During the interim the pilot may show signs and symptoms of staleness, and the causative factor might have been overlooked quite easily by the flight surgeon who had the case under observation.

## Necessity for Removal of Oral Infection

Neblett cited nine case histories of pilots whose general symptomatology was indicative of neurocirculatory disturbances which cleared immediately upon the removal of oral infection.

Pilots should have dental roentgenograms made frequently. The elimination of oral infection should be considered cause for grounding the pilot, as is sinusitis, diseased tonsils, or a deflected septum.

## Danger of Removable Appliances

J. L. Brown<sup>1</sup> of the Navy Dental Corps, in 1936 published "The Dangers of Prosthesis for Aviation Personnel." Commander Brown states that in case of a crash landing, removable appliances may become loose and then forced into the surrounding tissues, the pharynx or trachea, and that fixed prosthesis carrying porcelain pontics constitute a hazard almost as grave as the removable appliance. For this rea-

<sup>1</sup>Brown, J. L.: Dangers of Prosthesis for Aviation Personnel, U. S. N. Med. Bull. 34:532-533 (October) 1936.

son he questions the advisability of constructing extensive fixed bridges for flying personnel.

## Ear Symptoms as Related To Flying

My<sup>2</sup> report on "Ear Symptoms Incidental to Flying and The Factor of Overclosure of The Mandible" appeared in the same year. Six cases were reported wherein pilots suffered ear pain and dizziness on sudden loss of altitude. Each of these pilots was entirely relieved of the symptoms after repositioning the mandible, thereby increasing the vertical dimension and presumably relieving the compression of the eustachian tubes. This theory was later borne out by R. A. Lowry<sup>3</sup> of the Navy Dental Corps, who wrote a comprehensive report covering observations of several hundred pilots. Doctor Lowry also describes an interdental splint which is used in aviation dentistry. There is, however, considerable difference of opinion on the effects of overclosure of the mandible among flyers. During the Institute of War Medicine and Surgery for Dentists, held in Chicago in October, 1942, two flight surgeons presented somewhat divergent opinions, Lieutenant McCune<sup>4</sup> had this to say:

"In the diagnosis of eustachian tube disturbance the following mouth conditions should be regarded as suggestive: (1) Natural teeth wherein there is a wide overclosure; (2) lack of molars, either bilateral or unilateral; (3) teeth short from the gingival to the occlusal surface; (4) mouths in which the curve of Spee is lacking; (5) posterior bridgework with improper oc-

<sup>2</sup>Willhelmy, G. E.: Ear Symptoms Incidental to Sudden Altitude Changes and Factor of Overclosure of Mandible, U. S. N. Med. Bull. 34:533-541 (October) 1936. Relationship of Overclosure of Mandible to Ear Pains While Flying, DENTAL DIGEST, 47:544-546 (December) 1941.

<sup>3</sup>Lowry R. A.: Loss of Intermaxillary Distance: Effect on Aviators and Relief by Interdental Splint, U. S. N. Med. Bull. 37:367-380 (July) 1939. Summary of Relation to Aviation of Loss of Intermaxillary Distance (with Faulty Ventilation of Tympanum), Mil. Surgeon, 85:323-324 (October) 1939.

<sup>4</sup>McCune, Q. A., Lieut. (MC) USNR: Lecture 18 in Lectures on War Medicine and Surgery for Dentists, Chicago Dental Society, 1943, page 88.

clusion; (6) poorly fitting dentures, permitting overclosure of the mandible. The correction of these conditions lies in the repositioning of the mandible—solely a dental problem.”

Lieutenant Pieper<sup>5</sup> was more conservative:

“Overclosure of the mandible plays a prominent part in the production of some of these eustachian stenoses; but from my experience, I do not believe it is a common cause. The pilot who complains unduly of ear symptoms, however, the pilot who has an overclosure, should be treated with splints for a trial flight, and if relief is obtained, then attempts should be made to build up his bite in whatever manner is indicated. I have seen many pilots with overclosure of the mandible who tolerated altitude changes just as well as those with a normal bite. I believe that we have in the past disqualified too many young men because of this condition . . .”

Doctor H. G. Armstrong, as head of the Physiological Research Laboratory at Wright Field, has investigated almost every phase of aviation medicine including the dental aspects. He and Doctor R. E. Huber,<sup>6</sup> published in 1937, a report on the effects of high altitude flying on human teeth and restorations. As a result of clinical study of small groups of U. S. Army Air Corps pilots and observers, and a laboratory study of five freshly extracted vital human teeth, they concluded that the environmental conditions encountered at altitudes between 10,000 and 40,000 feet, in addition to the inhalation of oxygen cooled to a maximum of 60° F., have no deleterious effect on human teeth or restorations.

I do not know whether Armstrong and Huber considered oxidation of bridgework and fillings deleterious. I would like, therefore, to report three cases wherein restorations tarnished, thus showing oxidation. In each of these cases the only time tarnish would occur would be after the patient had been “on oxygen.” In one of these even gold foils turned dark. The reason for this may be that the chemistry of the mouth caused a more rapid action of the oxygen.

#### Toothache and Periodontitis

In September, 1942, the *British Dental Journal* published an abstract entitled, “Dental Disturbances in Airmen,” which said in part:

Complaints of toothache and dental disease, especially acute exacerbations of chronic periodontitis and granuloma, are common among flying personnel. An English airman declared that he and many of his colleagues had suffered from toothache during flying, the pain ceasing on landing. Dreyfuss recounted a personal observation of a student of aviation to whom he was unable to give adequate dental treatment for lack of opportunity. His teeth gave him no trouble on the ground, but when he reached 1,500 or 1,800 metres he always got a severe toothache which lasted until he landed. This was traced to a subacute pulpitis in the lower molar and did not occur again after the tooth had been devitalized. Colonel Meier, after examining the relatively small material in the Swiss air force, found that in most cases there was a possibility that cold air might promote periodontal disease in high flying personnel. About 25 per cent of airmen on full duty complained of dental troubles in a questionnaire, in many cases of neuralgic pains in the teeth in high flying and diving. A. Ott mentions the case of a patient with a granuloma under treatment which gave no trouble under 3,000 metres but became painful above this height; and quotes Schmuziger for a similar case cured by apicoectomy. He also recalls that sudden toothache is associated with exhaustion in high mountain tours, and that a granuloma may flare up into an abscess in the same circumstances.

In 1935 an air line pilot apologized to me for what he thought was a far-fetched complaint. His story was that he had had pain in his two upper central incisors whenever he flew at 12,000 feet or above. A roentgenogram dis-

closed no periapical change. On examination, the teeth were found to be slightly discolored; they did not respond to pulp tests of electricity or ice. I flew with the patient, and at 8,000 feet, the altimeter was covered, so that the pilot could not see it. At 11,800 feet he said that his teeth were starting to hurt. Back at the office I opened into the pulp chamber of both teeth and found them to be pulpless. Leaving the pulp chamber open eliminated the pain. The chamber was then sealed with temporary stopping and cement. The pain returned on reaching 8,000 feet. This was simply a matter of gas expansion in rarefied atmosphere. The teeth were extracted.

#### Effect of Flight on Dental Pulp

Lipson and Weiss<sup>7</sup> have published an interesting article on the effect of flight on the dental pulp. This is a recent article and leads to the thought that if every dentist who encounters a symptom which he feels is related to flying would pass his observation along, others in the field could be benefited.

#### Mouth Inflammation and Low Grade Infections

Several dentists who have daily association with pilots have observed that mouth inflammation or low grade infections around the gingivae of the teeth seem to become worse after flying. Letters have been received from four Air Corps dental officers, asking the cause and treatment of this condition. I believe that fatigue may be a factor in this. There is also the possibility that oxygen balance and atmospheric pressure changes have some effect. Determination of the cause is a subject that warrants investigation.

621 Professional Building.

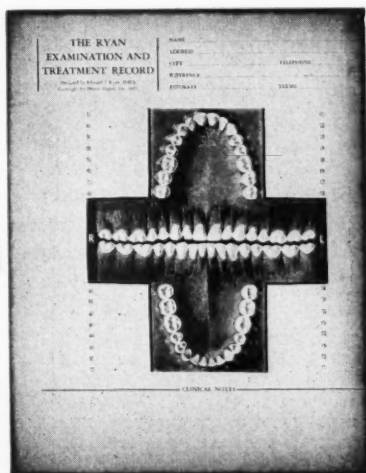
<sup>7</sup>Lipson, J. J. and Weiss, S. G.: The Biologic Approach to Problems in Aviation Dentistry, J.A.D.A. 29:1660-1663 (September) 1942.

<sup>5</sup>Pieper, H. C., Lieut. (MC) USNR: See footnote 5, Lecture 19, page 92.

<sup>6</sup>Armstrong, H. G. and Huber, R. E.: Effect of High-Altitude Flying on Human Teeth and Restorations, DENTAL DIGEST, 43:132-134 (March) 1942. Armstrong H. G. and Heim, J. W.: Effect of Flight on Middle Ear, J.A.M.A. 109:417-521 (August 7) 1937.



# Suggestions for the use of The Ryan Examination and Treatment Record



## TYPES OF PENCILS

Yellow	Mongol No. 867
Gray	Mongol No. 819
Red	Mongol No. 866
Blue	Mongol No. 865
Yellow	Castell No. 40
Gray	Castell No. 57

Mongol pencils are made by Eberhard Faber; Castell by A. W. Faber.

## SUGGESTED SYMBOLS

Each dentist may develop his own system of symbols but the following specific markings have been found simple and adequate:

**Soft Lead Pencil**—(a) Porcelain fillings are indicated by a pencil outline.

(b) Porcelain jacket crowns and bridges are shown by cross-hatching with lead pencil across the corresponding tooth or teeth on the chart.

(c) Missing teeth are blocked out with a soft lead pencil.

(d) Abrasions are represented with a soft lead pencil.

**Blue Pencil**—(a) Cavities are indicated with blue pencil.

(b) Advisable restorations are demonstrated with blue pencil.

**Red Pencil**—(a) A red line is used to indicate the presence of a root canal filling.

(b) A red outline shows the presence and position of an impacted tooth.

(c) Red pencil is used to represent pulp involvement.

(d) A red "X" is made across a tooth to indicate that its extraction has been advised.

(e) Pyorrhea pockets are represented in red along the crest of the alveolar ridge (and a notation is made at the bottom of the chart if extensive gingivitis is present.)

1. The Ryan Examination and Treatment Record may be had in pads of fifty charts each. These pads fit conveniently in a standard 9½ by 11½ inch loose-leaf notebook which may be purchased at a five-and-ten cent or variety store.

2. Alphabetical dividers may be made by using a ten cent package of plain white paper of the same size as the charts with holes punched at the same distances, and a fifteen cent box of alphabetical index tabs. The holes are reinforced.

3. It is a good plan to keep a blank sheet of paper between the charts to prevent possible smearing of crayon or pencil markings; but this is not essential.

4. A fresh pad of charts may be kept ready for use in back of the notebook of active records.

5. The various types of restorations and their location in a particular mouth are shown with the use of polychrome pencils—gray, for amalgam; deep yellow, for gold. White pencil does not show up very well; consequently, porcelain may be indicated with soft lead pencil outlines or cross-hatching.

6. Spaces provided beside the quadrants with numbers corresponding to the teeth permit special notations concerning each tooth. As treatment progresses the blue markings indicating needed dentistry are erased, and the nature, location, and date of placement of each new restoration are recorded. Additional clinical notations are made if necessary in the space provided for that purpose below the chart itself.

7. It is essential to be consistent in any system of symbols or markings developed. To insure consistency, it is well to have a key page in the front of the notebook.

8. The exact record of conditions found in the average patient's mouth at the original examination can be completed in fifteen or twenty minutes, and the time it takes to keep a chart up to date is negligible.

9. When a chart is completed the necessary data (name, address, telephone, reference, estimate, and terms) are typewritten in the spaces provided at the top of the record. The date of the original examination is also recorded in order that the treatment dates (as shown in the quadrants at the sides of the chart) will be recognized as subsequent to the date of the original examination.

10. Provision is made on the back of the chart for bookkeeping records. This is merely for the convenience of dentists who wish to keep all records together, but may be ignored by dentists who have a satisfactory bookkeeping system which they need not discard or do not wish to discard. The Ryan Examination and Treatment Record may be employed as an additional or supplementary record to any established method of record-keeping dentists may have.

11. Although the Ryan Examination and Treatment Record was designed for the dentist's own convenience in his practice, the charts have been found to have a definite informative value in explaining conditions to patients. The charts are also particularly helpful in reporting dental conditions of patients to cooperating physicians.

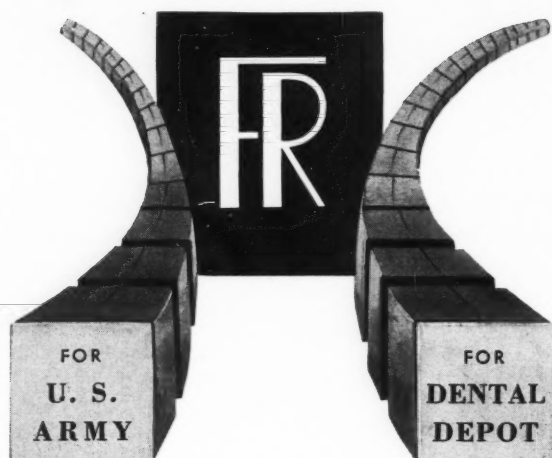
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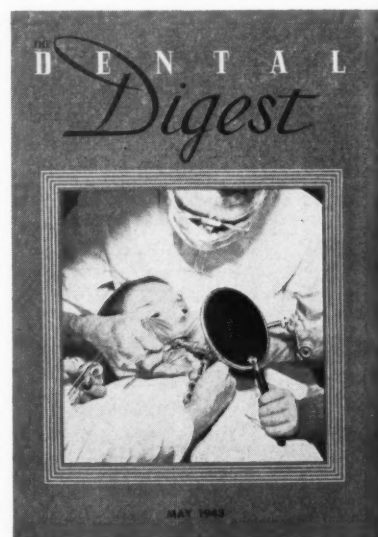
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## Contra-Angles



#### We Had It Coming . . .

Reproduced below is a picture of the May cover of the DENTAL DIGEST. For this cover we have been roundly criticized and have received not a single letter of commendation. We had it coming. The picture is not true to dental life.



The best letter received, telling us what was wrong with this picture came from a good friend of the magazine and its editor and a long-term subscriber, Walter H. Jacobs, New York City. Readers will probably find Walter's criticism of the cover pretty much in line with their own reactions. Here is his comment written under the title, "What Makes Dentists Unpopular":

"Since the first dental medicine man went to work in his dark cave office, he probably wondered why more of the people of his tribe didn't come to him for advice and treatment. All through the ages dentists have been wondering about the same question. And, all through the ages came the various an-

(Continued on Page 316)



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The American Dental Association has been far more realistic in its approach to the problems of the future world than has the American Medical Association. The Council on Dental Health of the American Dental Association has already begun studies of social trends on a national scale: prepayment plans, low-income group plans, methods of caries control. The American Dental Association will have a definite program of dental care to offer the government.

The day following Doctor Fishbein's reactionary speech the House of Delegates of the American Medical Association came to good sense and appointed a Council on Medical Service and Public Relations "to investigate matters pertaining to the economic, social and similar aspects of medical care for all people." The American Dental Association is a year ahead of the American Medical Association in this kind of planning.

During the studies and the deliberations of the Councils of the American Dental Association and the American Medical Association, we hope that no one in either profession will prejudice the case or anticipate the conclusions by speaking too early and out of turn.

# Aerodontia

GLENN E. WILLHELMY, D.D.S., Kansas City, Missouri

## DIGEST

It is the purpose of this article to summarize the available information on dentistry as related to aviation. To date, little has been done in this field, but the great strides in both military and commercial aviation are certain to present new dental problems. Aerodontia may be a strange term today; but I believe this term will be a familiar one ten years from now.

TWENTY YEARS ago, in 1923, the first writing on the subject of aerodontia appeared. In that year, H. C. Neblett, who was an Air Corps physician pointed out that apical abscesses and chronic periodontoclasia, either separately or combined, were not an unusual cause of staleness in pilots. Generally speaking, when symptoms and signs of staleness are manifested in a flyer, the cause is not often at first apparent. Later there may be evidence of an acute dental process. In the interim the pilot may be temporarily grounded and kept under observation and treatment for such symptoms as slight headache, dizziness, gastro-intestinal disturbances, loss of appetite, fatigability, and distaste for flying. Neblett pointed out that until the oral infection is located, the cause is usually attributed to excessive flying, overwork in administrative details with close confinement, lack of exercise, and worry from whatever causes.

The following paragraph from Neblett's report is still valid:

In the examination and selection of individuals for pilots, mental and physical perfection in them is essential in so far as is possible to be attained. On the whole, those essentials must conform to a definite standard of examination for all flyers. Yet in the qualification of pilots for the air service, there is no one thing in their physical make-up which is given as little concern as the true condition of their teeth. These, for the

most part, are of interest only in so far as microscopical evidence points to their general condition of soundness and to the required number necessary for the function of mastication. These having fulfilled requirements at the time of the initial examination and acceptance of the pilot, frequently, become diseased later. This is caused principally by neglect on the part of the individual through disregard of personal dental hygiene and lack of a frequent dental survey and treatment. A very broad latitude is therefore allowable relative to general dental requirements and to oral hygiene, with resultant disease of the teeth being frequently manifested. On the other hand, a sinusitis, a deflected septum, diseased tonsils or enlarged turbinates that obstruct the respiratory channels are causes for rejection of the applicant until successfully removed. And for a pilot they may cause temporary disqualification until properly treated. Again, diseased teeth or gums are rarely given attention by those concerned until the local symptoms become so severe that the dental surgeon is consulted for relief and treatment. During the interim the pilot may show signs and symptoms of staleness, and the causative factor might have been overlooked quite easily by the flight surgeon who had the case under observation.

## Necessity for Removal of Oral Infection

Neblett cited nine case histories of pilots whose general symptomatology was indicative of neurocirculatory disturbances which cleared immediately upon the removal of oral infection.

Pilots should have dental roentgenograms made frequently. The elimination of oral infection should be considered cause for grounding the pilot, as is sinusitis, diseased tonsils, or a deflected septum.

## Danger of Removable Appliances

J. L. Brown<sup>1</sup> of the Navy Dental Corps, in 1936 published "The Dangers of Prosthesis for Aviation Personnel." Commander Brown states that in case of a crash landing, removable appliances may become loose and then forced into the surrounding tissues, the pharynx or trachea, and that fixed prosthesis carrying porcelain pontics constitute a hazard almost as grave as the removable appliance. For this rea-

son he questions the advisability of constructing extensive fixed bridges for flying personnel.

## Ear Symptoms as Related To Flying

My<sup>2</sup> report on "Ear Symptoms Incidental to Flying and The Factor of Overclosure of The Mandible" appeared in the same year. Six cases were reported wherein pilots suffered ear pain and dizziness on sudden loss of altitude. Each of these pilots was entirely relieved of the symptoms after repositioning the mandible, thereby increasing the vertical dimension and presumably relieving the compression of the eustachian tubes. This theory was later borne out by R. A. Lowry<sup>3</sup> of the Navy Dental Corps, who wrote a comprehensive report covering observations of several hundred pilots. Doctor Lowry also describes an interdental splint which is used in aviation dentistry. There is, however, considerable difference of opinion on the effects of overclosure of the mandible among flyers. During the Institute of War Medicine and Surgery for Dentists, held in Chicago in October, 1942, two flight surgeons presented somewhat divergent opinions, Lieutenant McCune<sup>4</sup> had this to say:

"In the diagnosis of eustachian tube disturbance the following mouth conditions should be regarded as suggestive: (1) Natural teeth wherein there is a wide overclosure; (2) lack of molars, either bilateral or unilateral; (3) teeth short from the gingival to the occlusal surface; (4) mouths in which the curve of Spee is lacking; (5) posterior bridgework with improper oc-

<sup>2</sup>Willhelmy, G. E.: Ear Symptoms Incidental to Sudden Altitude Changes and Factor of Overclosure of Mandible, U. S. N. Med. Bull. 34:533-541 (October) 1936. Relationship of Overclosure of Mandible to Ear Pains While Flying, DENTAL DIGEST, 47:544-546 (December) 1941.

<sup>3</sup>Lowry R. A.: Loss of Intermaxillary Distance: Effect on Aviators and Relief by Interdental Splint, U. S. N. Med. Bull. 37:367-380 (July) 1939. Summary of Relation to Aviation of Loss of Intermaxillary Distance (with Faulty Ventilation of Tympanum), Mil. Surgeon, 85:323-324 (October) 1939.

<sup>4</sup>McCune, Q. A., Lieut. (MC) USNR: Lecture 18 in Lectures on War Medicine and Surgery for Dentists, Chicago Dental Society, 1943, page 88.

<sup>1</sup>Brown, J. L.: Dangers of Prosthesis for Aviation Personnel, U. S. N. Med. Bull. 34:532-533 (October) 1936.

clusion; (6) poorly fitting dentures, permitting overclosure of the mandible. The correction of these conditions lies in the repositioning of the mandible—solely a dental problem.”

Lieutenant Pieper<sup>5</sup> was more conservative:

“Overclosure of the mandible plays a prominent part in the production of some of these eustachian stenoses; but from my experience, I do not believe it is a common cause. The pilot who complains unduly of ear symptoms, however, the pilot who has an overclosure, should be treated with splints for a trial flight, and if relief is obtained, then attempts should be made to build up his bite in whatever manner is indicated. I have seen many pilots with overclosure of the mandible who tolerated altitude changes just as well as those with a normal bite. I believe that we have in the past disqualified too many young men because of this condition . . .”

Doctor H. G. Armstrong, as head of the Physiological Research Laboratory at Wright Field, has investigated almost every phase of aviation medicine including the dental aspects. He and Doctor R. E. Huber,<sup>6</sup> published in 1937, a report on the effects of high altitude flying on human teeth and restorations. As a result of clinical study of small groups of U. S. Army Air Corps pilots and observers, and a laboratory study of five freshly extracted vital human teeth, they concluded that the environmental conditions encountered at altitudes between 10,000 and 40,000 feet, in addition to the inhalation of oxygen cooled to a maximum of 60° F., have no deleterious effect on human teeth or restorations.

I do not know whether Armstrong and Huber considered oxidation of bridgework and fillings deleterious. I would like, therefore, to report three cases wherein restorations tarnished, thus showing oxidation. In each of these cases the only time tarnish would occur would be after the patient had been “on oxygen.” In one of these even gold foils turned dark. The reason for this may be that the chemistry of the mouth caused a more rapid action of the oxygen.

#### Toothache and Periodontitis

In September, 1942, the *British Dental Journal* published an abstract entitled, “Dental Disturbances in Airmen,” which said in part:

Complaints of toothache and dental disease, especially acute exacerbations of chronic periodontitis and granuloma, are common among flying personnel. An English airman declared that he and many of his colleagues had suffered from toothache during flying, the pain ceasing on landing. Dreyfuss recounted a personal observation of a student of aviation to whom he was unable to give adequate dental treatment for lack of opportunity. His teeth gave him no trouble on the ground, but when he reached 1,500 or 1,800 metres he always got a severe toothache which lasted until he landed. This was traced to a subacute pulpitis in the lower molar and did not occur again after the tooth had been devitalized. Colonel Meier, after examining the relatively small material in the Swiss air force, found that in most cases there was a possibility that cold air might promote periodontal disease in high flying personnel. About 25 per cent of airmen on full duty complained of dental troubles in a questionnaire, in many cases of neuralgic pains in the teeth in high flying and diving. A. Ott mentions the case of a patient with a granuloma under treatment which gave no trouble under 3,000 metres but became painful above this height; and quotes Schmutziger for a similar case cured by apicoectomy. He also recalls that sudden toothache is associated with exhaustion in high mountain tours, and that a granuloma may flare up into an abscess in the same circumstances.

In 1935 an air line pilot apologized to me for what he thought was a far-fetched complaint. His story was that he had had pain in his two upper central incisors whenever he flew at 12,000 feet or above. A roentgenogram dis-

closed no periapical change. On examination, the teeth were found to be slightly discolored; they did not respond to pulp tests of electricity or ice. I flew with the patient, and at 3,000 feet, the altimeter was covered, so that the pilot could not see it. At 11,800 feet he said that his teeth were starting to hurt. Back at the office I opened into the pulp chamber of both teeth and found them to be pulpless. Leaving the pulp chamber open eliminated the pain. The chamber was then sealed with temporary stopping and cement. The pain returned on reaching 8,000 feet. This was simply a matter of gas expansion in rarefied atmosphere. The teeth were extracted.

#### Effect of Flight on Dental Pulp

Lipson and Weiss<sup>7</sup> have published an interesting article on the effect of flight on the dental pulp. This is a recent article and leads to the thought that if every dentist who encounters a symptom which he feels is related to flying would pass his observations along, others in the field could be benefited.

#### Mouth Inflammation and Low Grade Infections

Several dentists who have daily association with pilots have observed that mouth inflammation or low grade infections around the gingivae of the teeth seem to become worse after flying. Letters have been received from four Air Corps dental officers, asking the cause and treatment of this condition. I believe that fatigue may be a factor in this. There is also the possibility that oxygen balance and atmospheric pressure changes have some effect. Determination of the cause is a subject that warrants investigation.

621 Professional Building.

<sup>5</sup>Pieper, H. C., Lieut. (MC) USNR: See footnote 5, Lecture 19, page 92.

<sup>6</sup>Armstrong, H. G. and Huber, R. E.: Effect of High-Altitude Flying on Human Teeth and Restorations, *DENTAL DICEST*, 43:132-134 (March) 1942. Armstrong H. G. and Heim, J. W.: Effect of Flight on Middle Ear, *J.A.M.A.* 109:417-521 (August 7) 1937.

<sup>7</sup>Lipson, J. J. and Weiss, S. G.: The Biologic Approach to Problems in Aviation Dentistry, *J.A.D.A.* 29:1660-1663 (September) 1942.





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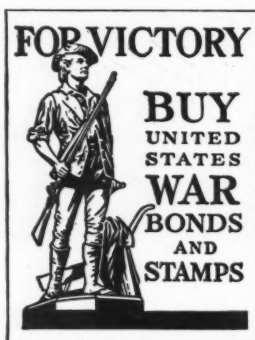
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swers: economics, disinterest, lack of time, ignorance, fear, pain. A glance at the photograph on the cover of one of our dental magazines will help to give a few more of the answers to the great mystery, 'What makes dentists unpopular?'

"A closer look at the picture we are commenting on will show a patient, or the last earthly remains of a patient, sweltering under a conglomeration of dentist's fists, assistant's paws, hand mirror, handpiece, bur, rubber dam, rubber dam holder, contra-angle, air or water syringe, college pliers, mouth mirror, and with the dentist's nose and mouth pushed forward under a gauze mask. We will also include in this ridiculous setup a trick eyeglass binocular attachment dropping down toward the patient like the outstretched tentacles of an octopus about to close in on the already suffering dope in the chair! Any patient who would allow all this impedimenta and armamentarium to be inflicted on him and not fly out of the chair and office must be a dope.

"Now let us go over the picture a bit more in detail. The patient is holding a hand mirror and if he or she is not in rigor mortis the idea must be that the patient wants to see what is going on. There are two reasons for this: (1) the dentist being a wise guy knows that he can do this particular operation and would like to impress the patient with it; (2) and most likely, the patient has no confidence in the dentist and wants to know just what the hell is going on under the load in front of him. Does a good surgeon ever ask you to hold a hand mirror, so that you can observe how he does an amputation, an appendectomy, or even open a furuncle? In any case, I don't see how in the world the patient expects to see anything with the rubber dam up over his eyes. Anyway, the patient is showing 'fight.'

"One look at the getup on the dentist and we can see why there might be a lack of confidence. This particular operator evidently has a cold, halitosis, or a rum nose from a drinking bout the night before, because he keeps his mouth and beak hidden behind a mask. Then again, his eyes must be so bad that ordinary glasses

(Continued on Page 319)

will not do, so he has to resort to octopus arm special attachments to find out which tooth requires operation.

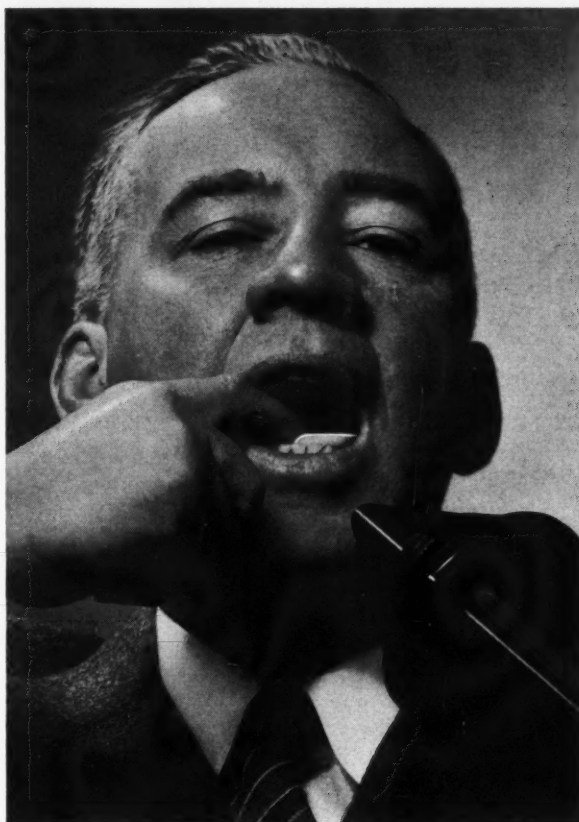
"The worthy assistant has her fingers done up like an Iroquois in war paint. Instead of keeping the office clean and neat, answering the telephone, looking over the records, ordering new supplies or sterilizing the instruments, she is doing her bit to maul the patient. One hand is holding college pliers as if to impress the patient that the dentist really owns one, and with her other hand, she is using an air or water syringe, which would indicate that the dentist is operating in such a manner as to overheat the tooth.

"Over the patient's mouth, stretching, tearing, and torturing the muscles, is the one instrument that has done more to defame dentistry than all the exposed pulps on record, the rubber dam! The dam might be good dentistry, but it should be reserved for work on prisoners of war; that is, the prisoners we take. Finally, behind the dam, fighting for his breath, is the patient, and he has the look of one who realizes that the men inside of a submarine just hit by a depth charge are quite lucky compared to him.

"This particular over-fussy, super-glamorous, inefficient dentist has about as much chance of getting this patient to like dentistry as he has to win a four horse parlay. If Dentistry can learn, let it look at this one picture and see what makes dentists unpopular: ostentation, high pressure, complication, unnecessary discomfort, affectation, superficiality, and lack of confidence.—Walter H. Jacobs."

#### **Holding the Mirror for Self-Reflection . . .**

Just now I had a telephone call from a distraught patient. This man is a successful executive but the pulp in an upper molar that was bothering him at this moment was the most important thing in the universe to him. He has a pulp undergoing degeneration. Why tissues degenerate, I do not know. Why the blood vessels go bad, the heart falters in its function, the kidneys become diseased, and pulps undergo change—these are subjects tightly wrapped in mystery. There is no local



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In your ORAL HYGIENE this month

## "This is a time for plain speaking"

**"Rank Without Authority,"** in July ORAL HYGIENE was "prepared as a tribute to the Army and Navy Dental Corps which labor so well under opposition from another Corps which should be expending its energies on its own multitude of functions." The article is not destructively critical; but its carefully documented facts have been presented because "this is a time for plain speaking." The facts have been "brought into the arena of open discussion so that inequalities, injustices, and the domination of one Corps in the Army and Navy will be corrected."

**"Production-Line Dentistry,"** by distinguished Doctor Howard R. Raper, is a penetrating analysis of the Pepper Committee's plan for revising dental practice, inspired by the ORAL HYGIENE editorial, "What—No Robots?"

**"The Case for Socialization,"** by Doctor Maurice R. Calman, expresses his disagreement with Doctor John W. Richmond's "status-quo stand," as presented in "Now is the Time to Plan," in November.

**"The Army Dental Office,"** by

Colonel Neal A. Harper, (DC), explains that "accomplishing the best and doing the most possible for the greatest number is the schedule by which the dental officer works." Colonel Neal's authoritative article was illustrated by ORAL HYGIENE's photographer, Homer Sterling.

And, again this month, ORAL HYGIENE presents another pictorial lesson in practice-management, in the series telling "How to Kill a Dental Practice," in which photographs emphasize common errors in practice-management.

Seven of ORAL HYGIENE's popular departments appear this month, including "Military News," which each month presents up-to-the-minute information; "Dentists in the News," gathered from the nation's dailies; "Technique of the Month," which this month presents Doctor I. J. Kupfer's technique for tooth bleaching; "Ask ORAL HYGIENE," the highly popular department which has been conducted for many years by Doctors Smedley and Warner; "Editorial Comment"; "Laffodontia"; and "The Corner."

In Your JULY

*Oral Hygiene*

reason for this pulp death so far as I can determine. The eye sees nothing unusual about the tooth nor does the friendly eye, the x-ray, help in the diagnosis. Along with change in the pulp, this patient suffers from gout, although his is the antithesis of the gouty diathesis. The patient does not drink; he does not smoke; he is not a "high-liver."

Undoubtedly there is some connection between the degenerative change in the pulp and other circulatory changes. There is not much we can tell people suffering from these conditions. All our life is spent in dealing with the abnormalities of people. If they did not have abnormalities, they would not be under our attention. All their abnormalities are not of a somatic kind. Some of them cut across the psychic field. Every time a patient comes to us he is a different person from what he was the time before. His dental disease is either better or worse; his psychic behavior is either better or worse. No one is entirely the same in body or soul from one minute to another. We would be less impatient with the apprehension and fears of the people who seek our aid if we could remember the psychosomatic nature of disease. Recently an excellent 387 page book has been written on the subject by professors from the Temple University Medical School, Weiss and English.<sup>1</sup> These authors know that physicians in general know only a little more about psychiatry than laymen. I presume that dentists could be thrown in the same category of ignorance. The average physician and dentist looks upon psychiatry as something to do with the mad house and the asylum, or some form of racket that is perpetrated on impressionable people. In a plea to physicians (and it would apply equally to dentists) to become interested in psychosomatic problems, Hamman is quoted by Weiss and English:

"If a physician is once persuaded to look within himself and to learn to identify unaccountable variations in mood and energy as the analogue of a manic-depressive cycle, the habit of ascribing failure and disappointment

<sup>1</sup>Weiss, Edward; and English, O. S.: Psychosomatic Medicine, Philadelphia, W. B. Saunders Company, 1943.

(Continued on page 325)

(Continued from page 320)

to ill luck or persecution as the promptings of paranoia, daydreams (in which satisfaction is secured for the rubs and indignities of life and retributive disaster showered upon enemies) as the harmless whisperings of schizophrenia, certain exaggerated reactions as the masks for defects and inadequacies, various somatic symptoms as excuses for retreat from difficult or unpleasant situations, he will forever after have an enduring interest in psychiatry."

And if we apply these simple tests to ourselves, we must admit that we are all at least borderline neurotics and psychotics, and from that self-evaluation we should develop a little more patience with our patients.

#### Mr. Wagner Adds . . .

One of the senators from New York, Mr. Wagner, has introduced a bill in the Senate to provide for the general welfare. This bill, 90 printed pages in length, provides for almost every disaster encountered by man. Specifically the bill provides for the following: . . . to alleviate the economic hazards of old age, premature death, disability, sickness, unemployment, and dependency; to amend and extend the provisions of the Social Security Act; to establish a Unified National Social Insurance System; to extend the coverage, and to protect and extend the social-security rights of individuals in the military service; to provide insurance benefits for workers permanently disabled; to establish a Federal system of unemployment compensation, temporary disability, and maternity benefits; to encourage and aid the advancement of knowledge and skill in the provision of health services and in the prevention of sickness, disability, and premature death; to enable the several States to make more adequate provision for the needy aged, the blind, dependent children, and other needy persons; to enable the States to establish and maintain a comprehensive public assistance program; and to amend the Internal Revenue Code."

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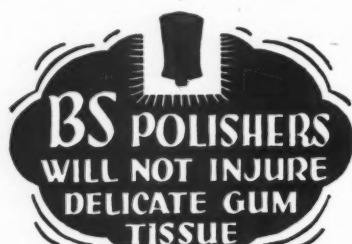
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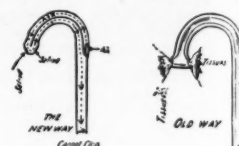
December 31, 1943. Self-employed persons, such as dentists, are to contribute 7 per cent of the market value of their services up to the first three thousand dollars. With the 20 per cent income tax, with the present social security taxes, with the insistence on buying government securities to finance the war, and with Mr. Wagner's bill calling for taxation to be added to this already top-heavy structure, most of the income received by workers in the United States will be deflected by the federal government. To complete the structure of socialism, and the word is used specifically and advisedly, we need only add compulsory contributions for food, shelter, clothing, and recreation.

In Mr. Wagner's bill there is no specific provision made at the present time for dental care, although there is a system of medical care whereby each insured worker and his dependent wife and children will be entitled to the services of a physician and necessary hospital facilities. The health program would be administered by the Surgeon General of the United States Public Health Service. He and the Social Security Board jointly "shall have the duty of studying and making recommendations as to the most effective methods of providing dental, nursing, and other needed benefits not already provided under this title and as to expected costs for such needed benefits and the desirable division of the costs between (1) the financial resources of the social-insurance system and (2) payments to be required of beneficiaries receiving such benefits, and shall make reports with recommendations as to legislation on such benefits not later than two years after the effective date of this title."

We should be very grateful that the Council on Dental Health of the American Dental Association will have sufficient and authoritative data to present to any government planning board on the subject of an effective dental program for all the people. As we said in The Editor's Page in this issue, Doctor Fishbein predicts that this bill will not pass. Perhaps it will not pass in its present form, but some kind of legislation of this general type will be

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- 1 large (large adult) each color

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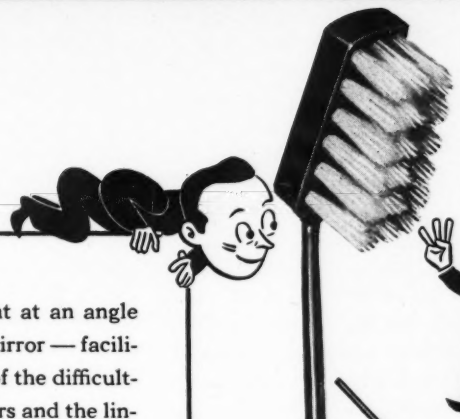
P. N. CONDIT  
Box 204, Back Bay Boston, Mass., U. S. A.

You may send the introductory package, all sizes all colors Saliva Ejectors, and charge to my dental dealer:

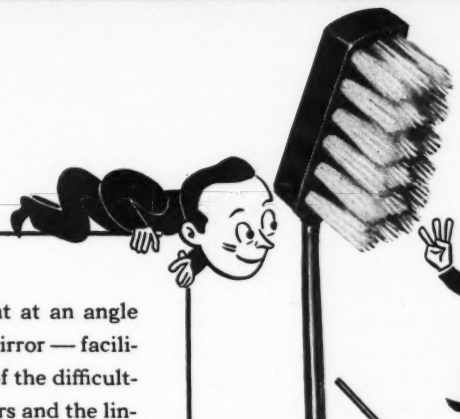
Dr. ....  
Address .....  
Dealer's Name .....



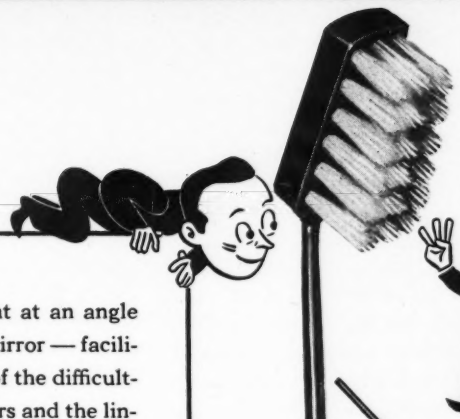
# Here are the reasons why you'll like ... THE SQUIBB *ANGLE* TOOTHBRUSH



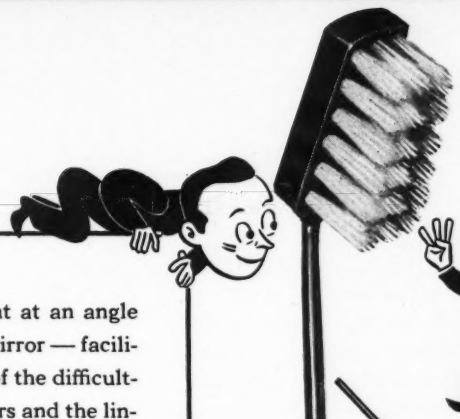
The shank—is bent at an angle like your mouth mirror — facilitates the cleaning of the difficult-to-reach back molars and the lingual surfaces of the incisors.



Three rows of bristles—six tufts to a row. Made of "Synton"\* they are water-resistant, efficient and longer-lasting. Two degrees of stiffness — hard and medium.



The Squibb Angle Toothbrush is adaptable to all types of mouths and all brushing techniques. It is a brush you will like to use yourself—one you will be pleased to recommend to your patients.



The thin, sturdy shank makes it easy to bring the bristles down to the gum line while keeping the brush head in a practically horizontal position when cleaning lingual interproximal spaces.

\* "Synton" is a trade-mark of E. R. Squibb & Sons.

The Forgotten Tooth Becomes the Remembered Tooth with the  
**SQUIBB *ANGLE* TOOTHBRUSH**



## If the War ended TODAY!

If you were to get the grand good news today that the war is won, what would be your plans for tomorrow? Most dentists today are hard pressed for time to take care of their increasing number of patients. The war's end is not likely to greatly alter this condition. It will be months and perhaps longer before any appreciable number of military dentists will be released for private practice. Appointment books will still be crowded.

In busy practices throughout the country McKesson nitrous oxide equipment is conserving the operator's time and energy. At the war's end — perhaps sooner — McKesson analgesia and anesthesia equipment will again be available for private practice. Plan now for the day when the war is won. Investigate the economic and operating advantages of McKesson pain control.



enacted into law. Of that we can be very sure.

### The Gift of Skill . . .

There are some dental educators who deprecate the skills of dentistry. They look down their blue noses at the dentist who has unusual skill and label him a mere mechanic. Usually these blue noses are inexpert technicians themselves. I hold that dentists should be very proud of their technical skills. Whoever can prepare a cavity deftly and painlessly; whoever can extract a tooth without tissue trauma; can make functional and esthetic replacements for missing parts— whoever can do these things skillfully is engaged in a vocation inferior to none. Dentists should know all they can about biologic sciences, but they should have very clearly in their minds the fact that the practice of dentistry in general consists in mechanical skills of a high order.

Recently I was on the receiving end of a surgeon's skill. The problem was extremely minor in nature, comparable to the removal of a deciduous tooth. Despite the minor nature of the surgery, I was mildly apprehensive of the local anesthetic, of the surgery per se, of the period of recovery. I was confident that the physician was trained well in biology; that his diagnostic sense was acute. But at the moment of the surgical procedure, I was particularly interested in his deftness and his skill. I had to accept his fundamental knowledge on faith, but his

skill or lack of it was something I would recognize at first hand. The same is true of the dentist. People come to us with the clear faith that we know what we are doing. How we do it, the amount of pain and discomfort that we inflict are not matters that they need accept on faith. I contend, therefore, that the dentist who is a careful operator, deft, skillful, rapid, is making a contribution to human happiness. When you hear dentists depreciating the profession and soured by their experiences, you can be pretty sure of one of two things: either such dentists lack skills and abilities or they have them and are not able to integrate them with human life and human personalities.—E. J. R.

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IN EVERYDAY  
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THE PIC has a wide arc permitting access to any desired area. It's ideal for removal of temporary fillings, copper bands, cement from margins, broken root tips, loosening tissue, etc., etc., etc.

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THE COOLEY 4 (not shown) is the perfect instrument for seating crowns, inlays, bridges.

Complete, illustrated brochure on request. Order thru your dealer.

Designed by DR. RALPH C. COOLEY

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